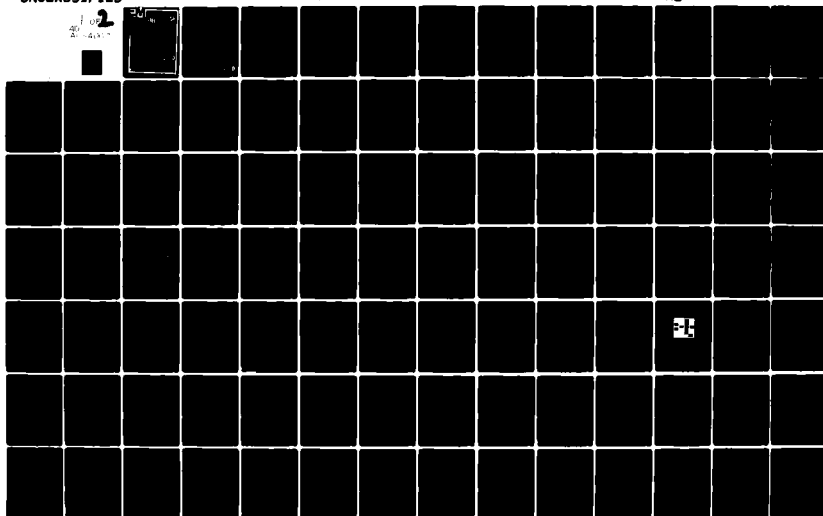


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**A MODEL for EDUCATION
and TRAINING for a
CRISIS-EXPECTANT PERIOD**

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WORK UNIT 4422D

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A MODEL FOR EDUCATION AND TRAINING FOR A CRISIS-EXPECTANT PERIOD

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Final Report
October 31, 1980

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that must be accommodated in a "crisis-expectant" education and training system. These latter system requirements include adaptability to various audiences, expandability during a crisis, and utility for peacetime disasters. These and other requirements for the model are presented in Chapter One of the report.

Chapter Two provides literature analyses for the four principal factors governing the design of the instructional materials: the audience, the context for system deployment, behaviors required in a crisis, and instructional format options. Chapter Three synthesizes input information into sets of requirements, displays instructional options, describes alternative deployment scenarios, and presents an evaluation of extant instructional programs. A composite model of an education and training system is then presented along with system variations appropriate for the three training scenarios. Suggestions for the implementation and delivery of the system are also included in this chapter.

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EXECUTIVE SUMMARY

This report presents a model of an education and training system suitable for preparing the adult U.S. population for a nuclear attack and guiding that population during a crisis-expectation period. The model is intended to be responsive to the following requirements:

- the system must address the needs of people in a variety of settings and from a variety of backgrounds;
- the system must be developed in peacetime, be capable of expanding in a crisis period, and be adaptable to different kinds of crises;
- the system must be sufficiently comprehensive and flexible to be adaptive to peacetime disasters.

The report consists of three chapters. The first chapter presents background information necessary to set the requirements for the model and to describe the design approach used to develop the model.

Chapter Two consists of a set of literature analyses designed to provide input to the model-building effort. Four factors are addressed: the nature of the audience being addressed; the context (settings, conditions) in which the system might be used; the behaviors (knowledge, skills, and attitudes) which might be required in a crisis situation; and considerations relative to the presentation of education and training.

Chapter Three presents a description of the kinds of materials and products that would be necessary to satisfy system requirements. This model is derived from the options and considerations presented in the input analysis, the initial system requirements, the demands inherent in likely training situations, and an analysis of existant education and training materials. The resultant model is described as a composite model because it embodies all of the features and components necessary to be viable for the three likely training scenarios.

Chapter Three also contains suggestions and recommendations for the delivery and implementation of the Crisis-Expectant Education and Training System and a tentative list of research and development activities necessary to complete the development of the system.

CHAPTER ONE

INTRODUCTION

The possibility of a nuclear crisis, whether precipitated by international conflict or by accidental causes, is as strong today as it ever has been. The necessity for having systems available that are capable of informing and training the U.S. public in a crisis situation has long been recognized by civil defense planners and by concerned citizens. In a crisis, our survivability as a nation may depend on the extent to which the public knows what to do and the degree to which responsive actions are carried out swiftly and effectively.

Yet, despite the survival value of civil preparedness information and skills, no comprehensive system exists for providing education and training for the U.S. public either prior to or during a crisis situation. Recent presidential directives calling for mass relocation planning for major population areas heightens the need for developing an educational system that is responsive to current emergency management policies and procedures. This document presents some of the design requirements necessary for the development of an educational and training system for a crisis-expectant period along with a model outlining materials, procedures, and arrangements for satisfying these requirements. A tentative set of recommendations for the development, delivery, and implementation of the system is also presented.

A. Background of the Project

The Far West Laboratory was contracted by the Defense Civil Preparedness Agency (DCPA), now part of the Federal Emergency Management Agency (FEMA), to develop a model of a crisis-expectant education and training system and some prototype modules which would provide up-to-date information for the general

public concerning a nuclear crisis. In very general terms, the defined need was to provide information about such questions as what to expect, what protective measures are being taken by local and federal agencies, and where to go and what to take if and when an evacuation order is given.

The project was guided by design requirements and assumptions evident at the beginning of the investigation. For example, it was clear that any information and training systems would have to be sensitive to the varying needs and attitudes towards civil defense of U.S. sub-populations. Also, the changing informational requirements from a peacetime period to a crisis "surge" period would have to be accommodated in the system. Accordingly, the Far West Laboratory proposed to undertake a project with four major goals:

- 1) to complete a review of the literature relative to crisis-expectance and crisis relocation with a focus on audience needs, possible behavioral objectives, contextual variations, and instructional considerations;
- 2) to design a configuration of materials, procedures, and arrangements to provide a crisis-expectant education and training system (CEETS);
- 3) to develop a set of CEETS modules in draft form; and
- 4) to present preliminary considerations and suggestions for further development and testing of system components and for system delivery.

Figure 1 displays the design process used to accomplish these major goals.

B. A Definition of Crisis-Expectant Education and Training

A crisis-expectant period is defined as a period of heightened public concern during which a crisis is anticipated. The crisis might be a nuclear attack from a hostile country, nuclear warfare between other countries, a terrorist threat, or an accident at a nuclear plant or installation. A crisis-expectant period might begin with an announcement from the President or through public recognition that a threat has emerged. The period ends with an announcement that an emergency situation is imminent and an order to take some defensive

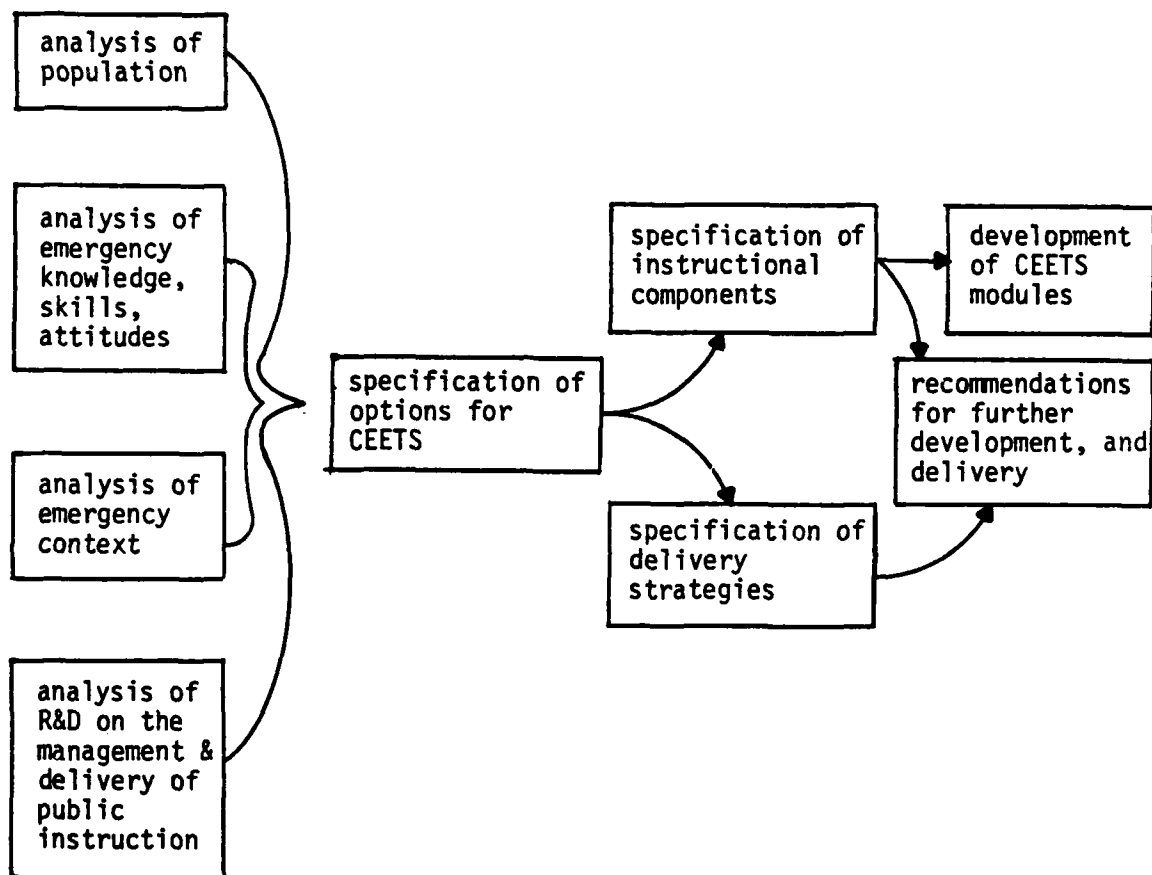


Figure 1. Design process for the CEETS model.

action, e.g., relocation.

Crisis-expectant education refers to the development of awareness and knowledge about various topics relating to the crisis, civil defense policies and procedures, appropriate preventive and responsive behaviors, and anticipated events and consequences. Training, on the other hand, refers to instruction in skills and procedures that cannot be adequately conveyed without some provision for practice and guidance.

C. The Need for Crisis-Expectant Education and Training

CEETS essentially addresses the need to increase the survivability of the U.S. population in time of crisis and/or attack. Although an attack is unlikely, current arsenals and the proliferation of nuclear weapons among non-aligned countries make a policy of readiness for nuclear attack prudent. Moreover, as President Kennedy once observed,

the history of the planet, and particularly the history of the 20th century, is sufficient to remind us of the possibility of an irrational attack, a miscalculation, an accidental war, or a war of escalation. (cited in DCPA, 1979c, p. 14)

Damage to the United States from a nuclear exchange could range from the destruction of 65 percent of the population if minimal protective measures were taken to a low of 20 percent of the population if current civil defense policies were implemented in full (DCPA, 1979c). The current civil defense strategy places primary emphasis on crisis relocation--an organized relocation of the almost 140 million people who live in risk areas (areas which are of sufficient military or economic importance to be likely targets) to safer locations. It is estimated that

effectively implemented evacuation programs could cut in half the immediate fatalities on both sides. For the United States this would mean saving 55,000,000 lives or roughly one-quarter of the total U.S. population. (DCPA, 1979c, p. 18)

However, the task of relocating such large numbers of people during a crisis ranks in complexity with the most extensive military campaign. The following comments indicate the kind of preparation and training that would be necessary:

- Experience in peacetime is to the effect that success in large-scale evacuation requires competently developed plans. (DCPA, 1979d, p. 18)
- It appears likely that more enlightened and willing support and participation of the public at large will be essential to survival and recovery regardless of the success of civil government in planning to meet its functional responsibilities. (Dunlap & Assoc., 1965, p. 7)
- Should an extremely severe crisis find the U.S. . . . unprepared . . . , there could be significant or serious reactions on the part of the population. It is certain that there would be demands for specific survival advice and instructions by the bulk of the public. (DCPA, 1979a, p. 57)

Thus, competent evaluation plans, public participation, and specific survival instructions are important elements of an effective education and training system. Additional reasons for having such a system and for insuring the rapid deployment of education and training early in a crisis period include the following:

1. Time Limitations and the Need for Training

Certain civil preparedness responses will require time for practice and guidance. It is unlikely that people could be briefed effectively about shelter construction techniques, shelter stocking considerations, and relocation preparation procedures if instructions were left to the last minute. Instruction in these kinds of skills and procedural competencies would be better attempted before or in the early stages of a crisis situation.

- Furthermore, even a highly intelligent citizen, if given the best possible instructions during a crisis, would not have time to learn basic facts about nuclear dangers and the reasons for various survival preparations. . . . A prudent citizen is advised to obtain and study the best instructions available before a crisis occurs. (Kearny, 1979, p. 3)

2. To Minimize "Milling" Behaviors

In applying "emergency norm theory" (the theory that collective behavior may be explained on the basis of a spontaneous search for meaning or structure by those confronted with an otherwise unstructured situation) to the nuclear emergency scenario, Perry et al. (1980) conclude that during an unstructured crisis period, people "mill," searching for meaning and structure. They suggest that previously established plans for civil defense procedures like population relocation can serve as a "standby" mechanism to provide an alternative normative structure for the group, thus avoiding a prolonged milling process.

This process is illustrated by Figure 2 below. An education and training program that has been developed before a nuclear crisis occurs can be used as a standby mechanism to provide the population with the structure they need for coping with a changed or changing environment.

3. To Minimize Maladaptive Responses

The ability of the threatened population to understand the nature of an emergency and to respond appropriately is central to its survival. Maladaptive behavior which may jeopardize survivability consists of a variety of responses to disasters including stress behavior such as panic, anti-social behavior such as looting, and counterproductive behavior such as evacuating spontaneously from one risk area to another.

These behaviors may result from a variety of situations: if people perceive the danger increasing rapidly while escape routes are blocked or being closed, they may give way to panic and attempt mass flight; when there is real or threatened food and supply shortages, looting may occur; and continuing stress and high uncertainty about the nature and duration of a danger may cause emotional problems.

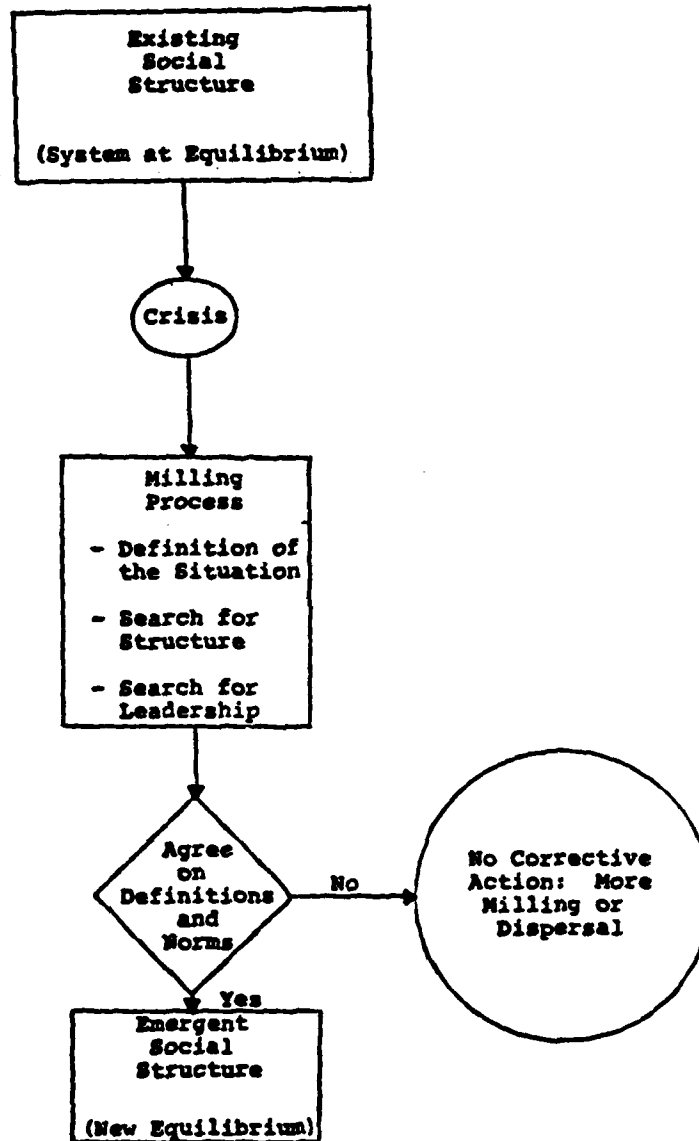


Figure 2. Flow diagram of emergent norm approach. Arrows represent temporal paths. (Adapted from Gillespie and Perry, 1976, p. 308.)

According to Dunlap & Associates (1965):

Maladaptive behavior is considered most likely to occur as the result of ignorance of appropriate actions than from other causes such as amoral, lawless, or asocial motives. (p. 77)

Much maladaptive behavior is caused by the unchecked spread of rumors which may magnify or distort the danger. The obvious solution is to provide people with valid information and criteria for evaluating what additional information they receive. As Beach (1967) points out:

An emergency prepared for ceases to be an emergency. . . . Having knowledge of what to expect and what to do, we will feel less anxious, apprehensive, and helpless. Such knowledge will reduce the emotional shock, the casualties, and the problems of recovery after disaster. . . . It was found that when soldiers who were about to participate in atomic bomb tests were given thorough and detailed lectures about the effects of atomic weapons, they experienced much less anxiety. Studies of cities bombed in World War II and of natural disasters make it clear that deaths and injuries can be greatly reduced when people take appropriate protective measures. (p. 9)

In a reanalysis of previous survey data, Rogers (1980) found that over half of the people in a risk area indicated that they would evacuate the area in advance of an order to relocate. One-third of those indicated that they would proceed toward destinations that were no safer than the original risk area (18.5 percent of the total sample). Reasons given for these actions on the part of maladaptive evacuees (e.g., 60 percent believed that their named destination would be safer) led Rogers to conclude:

This makes reasonably clear that lack of information is the primary reason that these individuals are likely to evacuate maladaptively. (p. 31)

We argue that the effectiveness of crisis relocation as an alternative method of dealing with nuclear disaster depends on the distribution of information as to the appropriateness of various behavior patterns. This we find to be true not only of spontaneous evacuation but of relocation as well. (p. 43)

4. The Possibility of Domestic Nuclear Threats

The use of nuclear technology in U.S. cities and industrial areas creates risks to public safety. The March 1979 malfunction of the nuclear reactor at

Three Mile Island in Pennsylvania drew public attention to the potential danger of a nuclear reactor meltdown. Despite safety testing and back-up systems, the possibility of mechanical breakdowns at a nuclear reactor cannot be discounted. Such an accident would not produce the heat and blast effects characteristic of the explosion of a nuclear weapon. However, if the reactor's containment building were breached, long-lived radioactive fission products such as strontium 90 and cesium 137 could be released into the lower atmosphere, where the extent of the area contaminated would depend on prevailing winds (Berger, 1976). A nuclear reactor could also be dangerously damaged by an earthquake or by deliberate sabotage. The more reactors that are built, the greater the probability that one of them will develop a problem that will warrant the relocation of the surrounding area.

Finally, discussion of the need for a crisis-related education and training program would not be complete without mention of the strategic significance of civil relocation capabilities, specifically in reference to an imbalance between the U.S. and the U.S.S.R.

In the absence of a population relocation capability, if the Soviets began to evacuate their cities, the United States [could be] placed in a bargaining position vis-à-vis the Soviets in which the more vulnerable U.S. population would be held hostage by Soviet weapons. (Huntington, in Christiansen et al., 1979)

Given that the concept of deterrence is integral to U.S. security, there is a need to demonstrate to both the Soviet Union and to America's NATO allies that the United States is capable of self defense.

In an age of strategic parity, the greater the vulnerability of American society, the less the credibility of the U.S. strategic forces as a deterrent to Soviet military action in Europe or elsewhere. A civil defense program designed to enhance the U.S. survivability strengthens deterrence by reassuring our allies of the continued meaningfulness of the nuclear coupling and conveying to the Soviets the seriousness of our commitment. (DCPA, 1979c, p. 11)

The achievement of a credible relocation capability requires quick, effective education and training and a comprehensive system for the deployment of this education and training.

D. Crisis-expectant Training and Education Requirements

In order to achieve the mission of preparing the population of the United States to respond effectively to a disaster, an education and training system must fulfill the following requirements:

- The system must be able to address the needs of people in a variety of settings and from a variety of backgrounds.
- The system must be developed in peacetime, but must be capable of dramatic extension in a crisis-expectant period.
- The system must be comprehensive and flexible enough to be usable in a variety of disasters.

In addition to educating and training people in protective measures against nuclear blast and fallout, the system must also prepare people for post-attack survival through in-shelter and post-shelter education and training.

Adaptive post-attack behavior is desired in the individual for two purposes: (1) to reduce his vulnerability to environmental changes and his concomitant demands on society; and (2) to enhance the willing and enlightened support and participation of the general public as a whole in bringing about the recovery of society. (Dunlap & Assoc., 1965. p. 9)

E. Complexities and Constraints

Complexity is one of the most significant characteristics of the learning environment for which crisis-expectant education and training must be designed. Education and training materials must be made available to accommodate a number of variables including differences in the attitudes, background and learning styles of people being trained; variations in the hazards and resources of the areas in which they are living; and changes in the information desired and required in time periods that range from peacetime to recovery. All potential obstacles to effective action by the public must be considered before the emergency so that strategies may be designed to overcome them. Anticipating

such problems in a peacetime environment requires both careful research and informed imagination.

Effective preparedness will always involve the planned use of relatively limited resources to prepare for a future planned use of relatively extensive resources. Nowhere is this principle more apparent than in the programming of public information and training efforts. Instructional material and messages must, essentially, be designed in one environment for rapid, effective use and dissemination in another. (Carr, 1976, pp. 80-81)

A central problem in designing an education and training system is the uncertainty regarding the situation for which the training must be designed. Because the United States population has never been confronted with a major nuclear war or disaster, there are no case histories available for use as a guide. Instead, information derived from behavioral studies of the British experience with evacuation in World War II and the atomic explosions at Hiroshima and Nagasaki may be used as a basis for extrapolation. These data are supplemented by deliberate efforts to construct scenarios of nuclear crises, e.g., The Nuclear Crisis of 1979 (Brown, 1976) and The Effects of Nuclear War (U.S. Office of Technology Assessment, 1979). An additional source of problems concerns the fact that national and local civil preparedness policies are in a state of transition from an earlier emphasis on in-place sheltering to more recent planning for crisis relocation. The extent and nature of crisis relocation planning (CRP) varies extensively in different states and communities. In order to design an education and training system, certain assumptions must be made about the environment in which such a system would be used. These include the following:

- Current civil defense policies (based on CRP) will remain in force for the immediate future (at least ten years).
- All major areas will have developed crisis relocation plans by the beginning of the crisis-expectant period.
- Local communities will be aware of these plans, and will be able to disseminate crisis information relevant to their areas.

- A shelter management training system will be in operation, with shelters stocked and available for use during the emergency.
- FEMA will have on hand, or will be given funds to produce, sufficient copies of CEETS materials;
- Public media systems will be functional and willing to cooperate with the civil preparedness effort.
- The events of the crisis will fall within the parameters projected by current information and scenarios.

F. Methodology

Just as the medium affects the message, a Research and Development methodology influences the nature of its product. In order to give the reader an understanding of our R&D conceptual framework, certain basic aspects of the systems approach to design and the way in which the project has been structured will be discussed in this section.

1. Definition of Terms

The following terms and definitions are critical to an understanding of our analysis.

- Crisis-Expectant Period--a period of increasing international tension or regional concern during which the population becomes aware of a potential danger (e.g. nuclear attack, meltdown at a nuclear reactor) and is eager to take protective action. It can vary from days to months, depending on the situation.
- Education and Training--instruction and the communication of information. Education refers to the development of awareness and the transmission of knowledge. Training refers to skill learning and involves guidance and practice.
- Adult-Learners--people over the age of 18 who are in the work force.
- System--"a set or arrangement of things so related or connected as to form a unity or whole" (Webster), with the implication that the whole is more than the sum of its parts.

- Model--a conceptual representation of a product or problem solution which describes what the product should be able to do, what it should look like, and how it will be developed.

In this report, we are designing a model or representation of what a coordinated set of materials and procedures should look like for providing knowledge and skills to the adult population in a crisis-expectant period.

2. Design Procedures

The design of the CEETS model has been governed by certain assumptions and procedures which may be described as follows.*

Design is viewed as a process of creative and disciplined decision-oriented inquiry. At the most general level, design inquiry may be defined as having such interactive process components as:

- the definition and the analysis of the problem and the formulation of the goals of the system to be designed;
- the devising of a set of differentiated alternatives--alternatives that are acceptable representations of the future system state;
- the display of criteria by which to examine and optimize the alternatives;
- the decision and selection of the most promising alternative(s) (application of the value system); and
- the communication of findings.

These process components of design are not completed step by step in a linear fashion but are carried out through cycles. As the different spaces of design inquiry are explored, the information and knowledge gained from this exploration is integrated with emerging images of the system being designed. Although at a given time the process component may be in focus, the designers contemplate the impact of their ongoing work both on what they have already done and what they are yet to accomplish.

*An adaptation from B. H. Banathy, "The Dynamics of Integrative Design," presented at the 1979 meeting of AAAS/SGSR in Houston, Texas.

Design may be approached in several ways. One approach is to begin with an analysis of the existing state of affairs and extrapolate or work from it toward the solution incrementally. Another approach projects an image of what should be and, taking what is known about desired ends, creates images of an ideal system that would facilitate attaining those ends. Once the images are developed, this latter approach considers barriers and constraints in order to attain a feasible and workable model of the system to be designed.

Those working with well-established systems, "systems with a history," are usually constrained by that history and follow the first approach. Those working with an emerging system have more latitude to evolve a model of an ideal systems state. The ideal system is an explicit formulation of the designer's conception of the system that could be created if the designer were allowed to design without constraint. The creation of an unconfined, ideal system model provides a focus for bringing together ideas about existing systems and future plans in a logical way and with practical effect, so that the system that best approximates the ideal state can be designed after considering barriers, constraints, and resources. In view of the nature of the design tasks in this project, the ideal system model approach has been selected.

The basic design process for any educational system involves the interaction of four operations: input, transformation, output, and feedback/adjustment (Banathy, 1977). These operations may be defined as follows:

- Input consists of information gathered from a variety of sources about every aspect of the educational system being addressed, from the learner and instructional environment to the content or competencies being taught.
- Transformation covers the major activities of establishing objectives, selecting appropriate content, methods, and educational resources, and developing assessment procedures and implementation arrangements.

- Output includes the results of transformation activities in which a "model" of the proposed instructional system is described and tested against an analysis of the system into which it will have to fit.
- Feedback involves analysis of the assessment and revision of the model so that it can be used as a basis for development of instructional programs or products.

These operations cover the first of several stages leading to the actual development and testing of an instructional product. These stages and the relationships displayed among them are diagrammed in Figure 3.

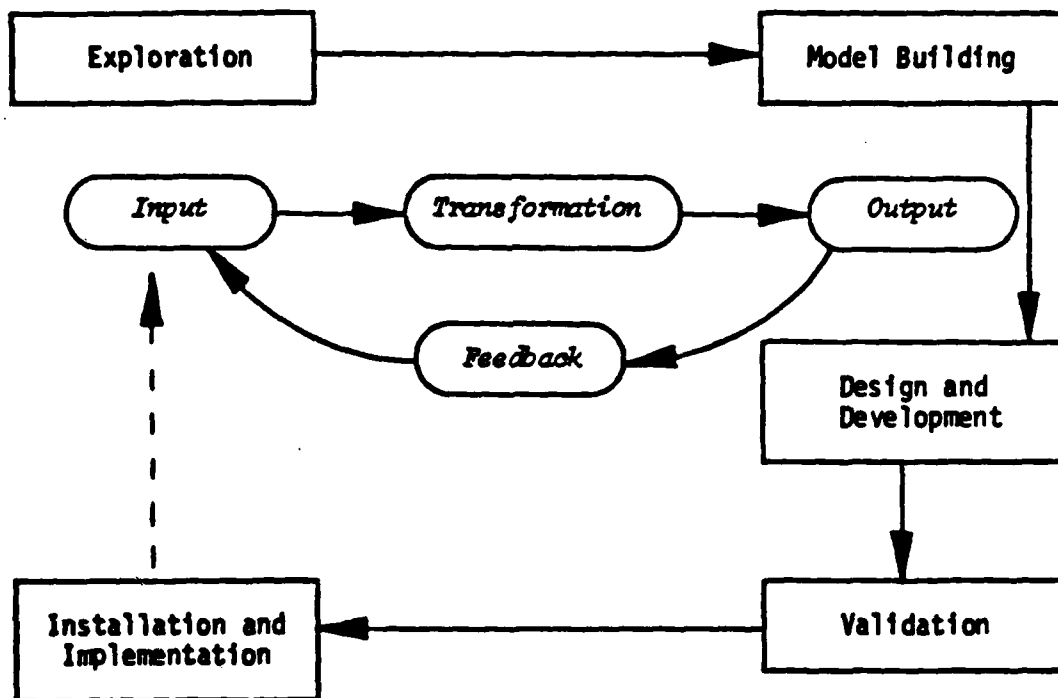


Figure 3. Stages in the development of an instructional product.

The various stages may be defined as follows:

- Exploration stage. The identification of the product or system that should be analyzed or the problem that needs to be solved.
- Model building stage. (1) The construction and testing of alternate conceptual models in order to determine what the product or solution should be able to do and how it should look; and (2) the plan for development, validation, and installation.
- Design and development. The design and the building of the working system with appropriate audiences.
- Validation. The supervised testing and revision of the working system with appropriate audiences.
- Installation and implementation. The "hands-off" trial of the system under naturalistic conditions.

This report is concerned with the first cycle of design activity in which the input provided by an extensive exploration of relevant literature is transformed through a variety of analyses into output in the form of the Crisis-Expectant Education and Training System.

One of the most prominent activities in the process of design is the development of a "model" of the system being addressed. In the present context, the term model refers to the conceptual representation of "something to be constructed," such as a product or solution to be developed. Its outcome is a description of what the product should be able to do, what it should look like and, perhaps, a plan for how it will be developed.

Spending the time to develop such a description of a proposed product or program gives the developer the freedom to speculate freely and consider a broad spectrum of alternative approaches to the problem with a comparatively modest investment of time and resources. From a careful evaluation of a model for an educational product, potential problems or deficiencies may be identified. If these are corrected in the design stage, the developed product will require less revision. When time allows, a number of alternative model solutions to an educational problem should be developed, compared, and synthesized in order to arrive at the most useful product.

CHAPTER TWO

REQUIREMENTS FOR A CRISIS-EXPECTANT EDUCATION AND TRAINING SYSTEM

Four major factors determine the form and content of CEETS: the nature of the audience being addressed; the context (settings, conditions) in which the system will be used; the behaviors (knowledge, skills, and attitudes) which will be required in an emergency; and the medium and mode of instruction. This chapter presents a discussion of these factors as well as an options profile which displays the major dimensions of each factor in a form that allows the designer to select useful combinations of elements.

A. Considerations for Focusing the Task

In most design tasks, a certain number of "givens" and constraints may be identified prior to the time when design input is collected. These givens and constraints, as well as the preliminary decisions that result from them, shape and define the design task as much as the information collected during the design input phase. Many of the decisions that are made at the outset of a project may be categorized as "watershed" decisions: that is, they focus the project on selected goals or sets of options. Some of these watershed decisions are presented in Table 1.

In carrying out this study, our task has been to review what has already been accomplished, synthesize findings, and use these findings to develop a conceptual framework within which the educational and training requirements of CEETS may be identified and described. Five analyses were conducted in order to identify these requirements. These analyses and their interrelationships are displayed in Figure 4.

Table 1 Summary of Considerations and Proposed Decisions

| System Requirements | Given | Available Options | Possible Resolution |
|------------------------------|---|--|---|
| • Audience (whom to teach) | All U.S. adults | Directly or via others? What about special populations? | System should first address those who are reachable and influential, while addressing others with specific media. |
| • Time (when to teach) | Crisis-Expectant period | CE period only vs. pro-vision for peacetime, crisis activation, and recovery periods. | Focus on CE and activation periods and indicate what components could also be used in other periods. |
| • Context (type of disaster) | Nuclear war | Include other nuclear emergencies and/or other major disasters requiring crisis relocation. | Focus on general information about nuclear attack; mention other nuclear emergencies; and refer to other disasters for illustration |
| • Knowledge content | Knowledge for surviving a nuclear war, especially what to do, where to go, what to expect | Focus on cooperating with FEMA (CRP, ORP, etc.) vs. personal survival; relocation vs. in-place survival. | Emphasize FEMA's role and survival value of CRP; but cover other responses as well. |
| • Skills content | Everyone must have appropriate skills | Emphasize cooperation vs. self-reliance, individual vs. social survival? Train for familiarity vs. proficiency in survival skills? | Emphasize skills needed for survival in group situation; provide training in self-reliance skills as an option. |
| • Affective content | People <u>can</u> survive a nuclear emergency | Motivate by stressing danger vs. focusing on people's survival capability? | Cautious optimism: show dangers, but also show solutions. |
| • Presentation | Use written modules; system must be able to be activated/expanded quickly | Written materials only or multi-media? | Develop preliminary written modules; design multi-media package and trainer's guide. |

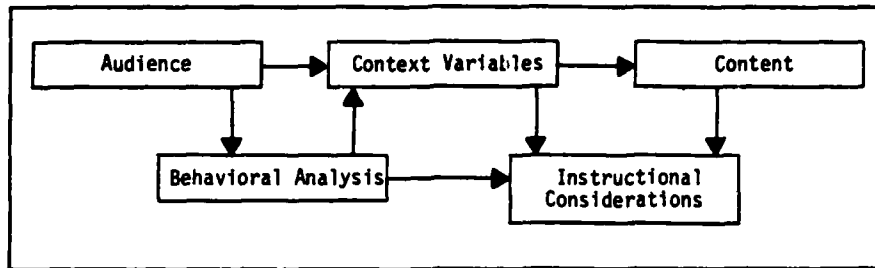


Figure 4. Model of the instructional design process.

To accomplish our task, we focused on each of the components identified in Figure 4, and addressed the following questions:

- Audience: What characteristics of U.S. adults need to be considered in the design of CEETS?
- Context Variables: What are the situational variations in the education and training process that are likely to be important?
- Behavioral Analysis: What knowledge, operations (skills), and affective behaviors (attitudes) must learners possess in order to maximize survivability?
- Content: What content must be transmitted?
- Instructional Considerations: What arrangements may be made to facilitate the learning process (to instruct, implement, and evaluate)?

B. The Audience for CEETS

The population of the United States is currently estimated at over 230 million people. About 70 percent of this figure are adults, that is, those considered legally capable of conducting their own lives. This means that the potential audience for crisis-expectant education and training consists of approximately 156 million men and women.

In order to define the training needs and requirements of an audience of this size, a framework within which to identify the characteristics of the audience must be considered. The following categories represent the beginning of such a framework:

- environment--whether the audience is located in a risk or host area, and whether its population will be relocating or not;
- expertise and position--an individual's previous familiarity with civil preparedness information/skills, and his/her organizational connections;
- resources--the presence or absence of physical, financial, or social resources affecting a person's ability to respond to an emergency; and
- psycho-social factors--values and attitudes, learning abilities, reactions to stress, and other relevant factors.

Any given individual might be described as simultaneously belonging to subgroups in all of these categories as illustrated in Figure 5 below. In designing training, it is important to consider the implications of all of the learner's associations and relationships.

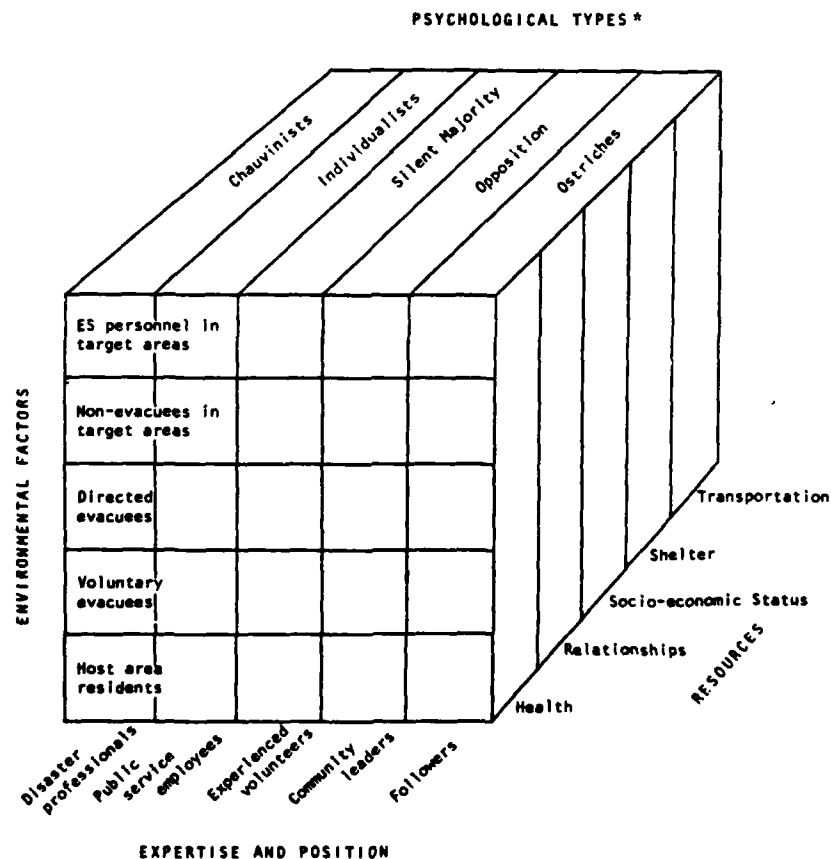


Figure 5. Audience categories.

* Based in part on typology of personality types by Harvey (1970). Discussion follows

1. Environment

Whether people are located in a risk or host area is likely to have a considerable effect on what they would have to do during crisis-expectant and surge periods, their perceptions of the danger, and the means available for training. Depending on the size and type of nuclear attack, the number of people living in target (high-risk) areas may vary from 7 million (if an attack is confined to "counterforce" strategic military installations) to at least 140 million (if an attack is directed against all large cities) (Sullivan, Hulburt, Marshall, McCormick & Sager, 1979). The rest of the population lives in areas which will probably be exposed to fallout, but not to blast and other direct weapons effects. If warning time permits, many of these areas may serve as hosts for relocatees. In both host and target areas, some emergency personnel may be protected in blast-hardened Emergency Operating Centers (EOCs). Given sufficient warning time for crisis relocation to be completed, a rough estimate of the proportions of the population located in risk and host areas during a nuclear attack appears in Figure 6.

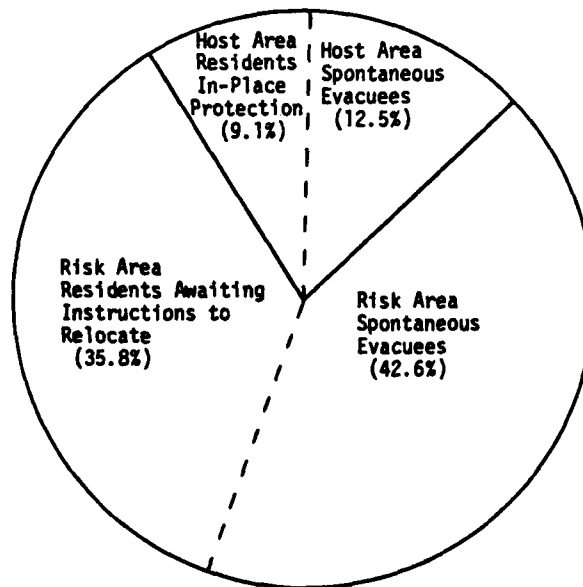


Figure 6. Location of population during a crisis.
(From Rogers, 1980.)

Based on available information, the characteristics and needs of the various subgroups defined by location are described as follows:

- Emergency service personnel in the target area--FEMA, Red Cross, military personnel and civilian police, fire, medical, and other essential workers who stay in the target area to conclude the evacuation, protect property, and serve those who stay in the risk area. These individuals will need special technical training.
- Non-evacuees--the third of the target population who would probably remain in their homes (Beach, 1967; Nehnevajsa, 1979) due to lack of understanding, attachment to homes, pets, or family, and/or ideological reasons. This group will need training in ways of protecting themselves in-place through public or expedient shelters.
- Directed evacuees--the largest group, which would relocate upon Presidential order by their own or public transportation. Evacuees would need to know where to go, how to get there, what to take, and what to do upon arrival. Considerable motivation might be required (Brown, 1975).
- Voluntary evacuees--people who evacuate spontaneously, often before the official order, to summer homes, relatives, or the wilderness (Nehnevajsa, 1979). They would need information on finding safe areas, building expedient fallout shelters, and on survival skills. This group is probably the most likely to benefit from written information acquired in peacetime.
- Permanent residents of host areas--people who are already located in relatively safe areas. They will need information on upgrading buildings for fallout shelter, how to organize their communities to receive twice their numbers, and how to adjust to sharing their basements or homes with evacuees (Beach, 1967).

In general, the location of the population being addressed would probably be the best indicator of the kind of locale-specific information they would need. Crisis relocation information, for example, would vary from city to city and, in some cases, from neighborhood to neighborhood.

2. Expertise and Position

People's past or present positions may have a considerable effect on the amount and kind of training they would need and the ways in which they would be willing to use that training during a crisis. In a crisis-expectant period, large numbers of people would be needed to staff emerging or adapted

service organizations. Some of these people would be involved because of their current positions in civic or emergency organizations; whereas, others would participate because of past experiences which have provided them with useful knowledge or skills.

An analysis of the population according to position and expertise yields the following groupings:

- Disaster professionals--the "organized civil defense core" (Bend, Cohen & McDaniel, 1966, p. 24) or "cadre personnel" (Dynes, 1968, p. 61) who occupy formal positions in civil preparedness organizations such as FEMA or the Red Cross. This group is extensively trained in peacetime, and will need specific information on plans for dealing with the crisis at hand.
- Public service employees--civil employees whose normal duties would be relevant to emergency preparation and response, e.g., the mayor, people in public works, public safety, etc. These employees belong to "established organizations, which would respond to disaster without fundamental changes in structure" (Stallings, 1968). They will need training in how to perform their duties in changed circumstances and how to cooperate with government planning.
- Experienced volunteers--people who have acquired relevant experience and/or training via emergency service organizations (Red Cross, Salvation Army), as part of public service efforts of social organizations (Scouts), during military service, or as a participant in previous disasters (Bend et al., 1966; Dynes, 1968; Nehnevajsa, 1979). They will need to have refresher training or updating, as well as orientation to the organization and function of the emergency service agencies with which they volunteer to work.
- Community leaders and group members--people whose personal or professional positions make them natural leaders, e.g., business managers, religious leaders, managers of educational or social agencies, ethnic community leaders, neighborhood leaders, or leaders of social associations (Chenault & Davis, 1978; DCPA, 1976a; Dynes, 1968; Stallings, 1968). Such people may be recruited for leadership positions and serve as links for reaching their constituencies, who may have similar skills.
- Inexperienced personnel--this includes the majority of the population who have no experience or background relevant to the disaster. These people will need basic information on how to protect themselves and their families, and how to cooperate with the authorities. However, many people will volunteer for emergency service during a crisis (Beach, 1967; Nehnevajsa, 1979) and will then need more specific training. Because this group is unprepared for the emergency, educational materials for them should be especially complete, consistent, and easy to understand (Bend et al., 1966).

The significance of an individual's position, expertise, or experience in areas related to civil preparedness seems to lie primarily in the degree to which it will determine the role that person will play during a crisis-expectant or crisis-activation and surge period. The more prominent the person's position as an organizational or community leader, and the more extensive and appropriate his/her relevant expertise, the more likely it is that he/she will volunteer or be recruited for a leadership position in some aspect of the emerging and expanding civil preparedness structure. In that case, he/she will need training in the duties of that emergency position as well as a general orientation to the hazards of and appropriate responses to the crisis situation. The identification and training of people with relevant expertise who could fill key roles in the emergency organization should be primary tasks in planning for civil preparedness.

3. Resources

Another factor which may have a significant effect on the amount and kind of education and training an individual may need concerns the relevant resources to which he/she has access. "Resources" is a general term embracing a broad variety of things which could be used by a person for self-protection during a crisis period. Resources include external physical aids, a person's own inherent qualities, and his/her social relationships. Some of these resources may be defined as follows:

- Health--the state of a person's health will determine not only the amount and kind of help he/she will need to take protective action such as relocation, but also what special supplies (such as insulin) may be needed in-shelter and afterwards. The better one's health, the better one's chance of contributing to individual and group survival (Dunlap & Associates, 1965).

- Relationships--an individual's ability to respond effectively in a disaster may be crucially affected by the network of community and family roles in which he/she is involved. Families tend to respond as a unit, and even emergency professionals may check up on or protect their families before reporting for duty (Beach, 1967). Family ties may delay action responses, such as evacuation, but may also help by extending information and warning. Subgroups, such as the aged or the handicapped, will certainly benefit from being part of strong kinship groups which feel obligated to protect them. When kin bonds are weak or absent, ties to other community members may serve a similar purpose (Perry et al., 1980). Family and community relationships can therefore be an important resource for receiving information, and serve as a basis for protective action.
- Socio-Economic Status (SES)--SES ascriptions usually depend on both physical resources and lifestyle. One's economic status has implications for how much money might be available for upgrading fallout protection; whereas, one's social status tends to relate to one's ability and willingness to benefit from information (Bertrand, 1967).
- Shelter--a house is a major resource in civil preparedness since its location and characteristics will determine whether or not it can provide fallout protection for its owners and for additional people. Families who own a vacation home have an automatic relocation destination in the event of a nuclear crisis (Nehnevajsa, 1979). One topic for crisis education should therefore cover assessing the protective capability of one's residence.
- Transportation--for people in a risk area, access to transportation is a crucial resource. Most Americans either own a car or know people who have cars (Nehnevajsa, 1979). However, the timing of the crisis, the condition of the car, and the availability of gas might modify their ability to use their cars for evacuation. People who plan to relocate in cars would need information on routes and plans for making fuel available. People without their own form of transportation would need information on public transportation.

4. Psychological Types

Predictions about the emergency response of people in any of the groups described so far may be subject to psychological factors which do not become apparent until the crisis. In such a situation, everyone will be subject to considerable stress. Dunlap & Associates identified the following stress-related maladaptive behaviors:

- withdrawal from association with others;
- loss of will to live or to make adjustments;
- unreasonable fear or panic;
- refusal to eat or to respond to proffered assistance;
- hostility toward authority;
- despair and purposelessness;
- guilt;
- frustration;
- fatalism; and
- dangerous curiosity.

There is some evidence that when people have been prepared for an emergency, they are much less likely to suffer debilitating stress reactions when the emergency occurs (Beach, 1967). The challenge seems to be one of devising methods by which people may rehearse productive disaster behavior without provoking premature and unnecessary stress reactions. A study of public information campaigns shows that a message must be "hooked up" with the motivational structure of target audience members if it is to evoke a desired response (Bend et al., 1966). Therefore, it should prove useful to examine the range of people's attitudes toward disaster in general and nuclear war in particular. According to Wenger (1978), these attitudes may differ considerably among groups and individuals:

In modern, complex communities . . . subcultural formation and value dissensus prevail. The proliferation of multiple, divergent values in these communities is impressive. Furthermore, these divergent values, though held with varying degrees of adherence, are pursued simultaneously within the system.
(p. 20)

An application of a typology of personalities (Harvey, 1970) to civil preparedness content yields the following groupings:

- Chauvinists--think simplistically, make extreme judgments and stick to them; value consistency, order, dogmatism, and authority; and favor civil defense for personal security and to support national power. They are good customers for pamphlets on civil preparedness and articles in civil defense journals.
- Rugged Individualists--see civil preparedness as a necessary evil, but would rather plan his/her own protection for self and family than depend on the authorities. This type is more likely to develop and stock a family fallout shelter or relocate to a wilderness area and, therefore, will need go-it-alone type nuclear protection and survival information.
- The Silent Majority--the largest group, consists of those who are responsive to peer groups and authority figures and who will follow any clear and credible plan in a crisis situation, but who are unlikely to seek out such information in peacetime. These are the "promissory acceptors" identified by Nehnevajsa (1979). They need clear, basic information in a crisis, and are very responsive to the media as sources.
- The Opposition--is a small (perhaps 10%) but often vocal group opposed to civil defense* on the basis of their own judgment or a distrust of authority. They will resist or argue against civil preparedness information in peacetime and, in a crisis, refuse or delay cooperation. Clear, factual information and logical discussion may convince some.
- Ostriches--are people who try to suppress awareness of the possibility of disaster and are therefore most subject to stress when it occurs. They will resist public information in peacetime or crisis and can best be reached by concerned friends or relatives.

Each of the groups and subgroups described in this section have their respective needs for education and training and their own preferred ways of acquiring information. In the following sections the varying conditions affecting information requirements will be discussed in more detail, as well as the content that might need to be taught, and the means available for presenting it.

*Most of the common arguments can be found in "Hiding from the Bomb, Again" in the August, 1979, Harper's magazine.

C. Context Variables

Education and training for civil preparedness must be flexible and broad enough to include both probable and possible variations in the context of a nuclear emergency. Three major types of variables which may be identified are: the amount of warning time before an attack; the extent of the attack and the nature of the targets; and the degree to which the community or nation is prepared to respond. In a given emergency, any combination of variations from each dimension could exist, defining both the threat and the appropriate response. These dimensions and variations are displayed in Figure 7 below. .

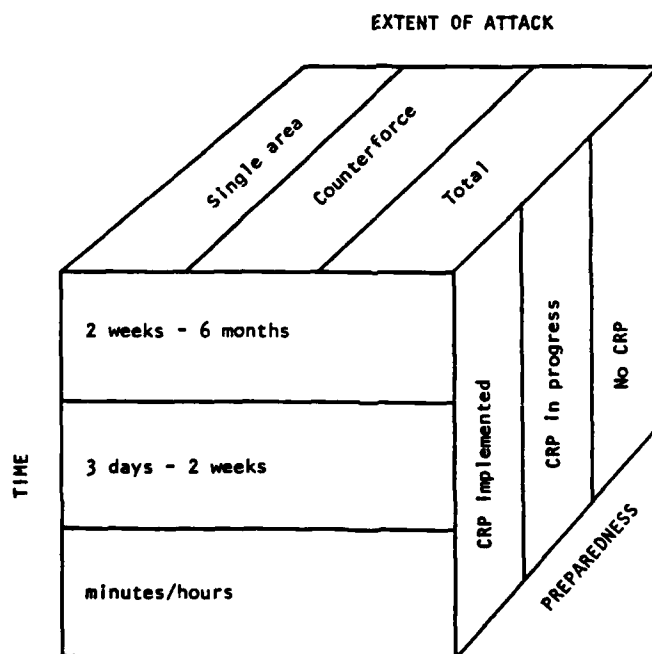


Figure 7. Context variables.

The nature and significance of each of these variables will be discussed in this section, followed by a summary of their implications for training and education.

1. Time Variables

Civil defense literature has featured a number of scenarios for a nuclear crisis. These can be divided into three major groups with regard to warning times: those which assume an extended crisis-expectant period; those which plan for a short crisis-expectant period; and scenarios which describe an attack with little or no warning.

a. An extended crisis-expectant period. Given the strategic maneuvering that has characterized relations between the United States and the U.S.S.R. in recent years, it is possible that a comparatively long crisis period might precede an attack. Perhaps the most elaborate discussion of the nature of such an extended warning period (6 months) is presented in The Nuclear Crisis of 1979 (Brown, 1976). Accordingly,

a kind of strategic warning (provided by the nuclear crisis) may be inherent in many if not most of the nuclear war threats that could arise in the decades ahead and that such "warning" could provide weeks if not months of time for emergency CD responses.
(p. 5)

An extended crisis-expectant period, assuming a massive diversion of public resources to the development of civil preparedness, would allow for the completion of crisis relocation planning, the expansion of the civil defense organization, the training of managers and coordinators, and the dissemination of education and training to the public.

b. A short crisis-expectant period. Much of current crisis relocation and organizational relocation planning is based on the assumption that, given the existence of appropriate plans and arrangements, most of the population in most risk areas could be evacuated in three to seven days (DCPA, 1979a). It is assumed that if evacuation plans and capabilities exist, 80 percent of the population (residents and evacuees) will be residing in low-risk areas by the time of the attack; they will use the best available shelter based on

national shelter survey data; and/or, they will upgrade fallout shelters to a minimum fallout protection factor (PF) of 50 (Sullivan et al., 1979).

A prototype State Crisis Relocation Plan (DCPA, 1976a) indicates that the Governor would order relocation at the request or order of the President, following a planning period. Evacuees would stay in host areas for about seven days and would be sheltered in congregate lodging facilities (CLFs) and private homes until an attack warning is received. At that time, they would move to fallout shelters while key workers would remain in risk area blast shelters.

To implement crisis relocation within a two-week period would obviously require superb planning and organization, especially with regard to education and training. People would need specific information on the general and local risks and hazards, whether and how to prepare for relocation, and how to protect themselves against the effects of nuclear weapons.

Other kinds of disasters, such as a threatened reactor meltdown (e.g., Three Mile Island in 1979), or the eruption of a volcano (e.g., Mt. St. Helen's, Oregon in 1980) may also have a crisis-expectant period when the onset and nature of the emergency are uncertain and evacuation of the area may be required.

c. Tactical warning. The third time-frame which must be considered is one in which an attack is launched unexpectedly, resulting in the need to shelter people "in-place," that is, in home fallout shelters or public facilities (DCPA, 1979a). This situation was the basis for civil defense planning during the 50's and 60's, and cannot be dismissed today. Such short warning might vary from 24 hours to less than an hour. The shorter the warning time, the less likely that successful evacuation of risk areas

could occur. The population could be caught in transit or forced to seek the best available shelter in risk areas.

Maximum readiness instructions call for using mass media to inform the public of what preparations to make and the location of shelters, and to call all civil defense personnel to duty (DCPA, 1979b). Public ability to receive and follow such directions would depend on the condition of the warning system and the time of day that the system was used. The current siren warning system can be heard by about 50% of the population during the day; whereas at night, hardly anyone would be awakened (Sullivan et al., 1979).

In light of the foregoing, a crisis-expectant education and training program should take into consideration the possibility that relocation may not be feasible. Information for seeking or preparing expedient shelters in risk-areas should therefore be included.

2. Variations in the Extent of the Disaster

Another factor that would obviously have an effect on the impact of an emergency and the ability of a population to respond to it is the extent of the disaster.

a. Single region. There are a number of scenarios for single region disasters. Although these most commonly involve natural disasters such as floods and hurricanes which may require evacuation, several kinds of regional nuclear emergencies are possible.

In a period of international crisis, an enemy might seek to exert pressure by threatening individual U.S. cities. Cities might also be threatened by terrorists with homemade or stolen bombs, or other radioactive materials. Many states have already developed plans to deal with such an eventuality (e.g., California, 1978). Another type of regional nuclear

emergency would be a meltdown at a nuclear reactor. The map in Figure 8 below shows the location of nuclear reactors planned, being built, or operating in the United States.

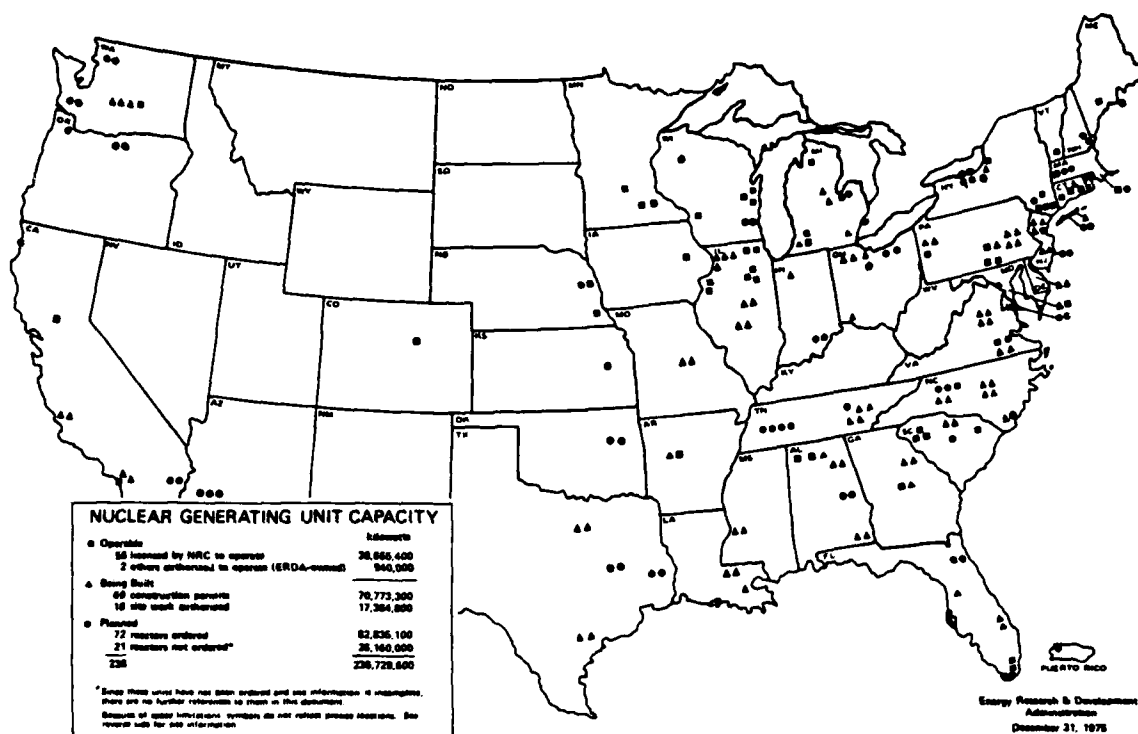


Figure 8. Nuclear power reactors in the United States.
 (From J. J. Berger, 1976, p. 196.)

People living in an area susceptible to a given type of disaster (e.g., hurricane, coast, flood plain, communities near a nuclear reactor) should be educated about the nature of the hazard in peacetime. In a crisis-expectant period, they would need regionally-specific information about how to respond.

b. Attack against military and defense targets. Strategists believe that in an international crisis, a nuclear attack might be limited initially to areas of the U.S. containing strategic nuclear retaliatory forces and other significant defense-related facilities. The populations of these

areas would therefore be at a higher level of risk during this period than the rest of the population (Sullivan et al., 1979). Within the contiguous 48 states, these targets include 47 military sites (missile fields, submarine bases, and Strategic Air Command bases), and 80 defense-related research facilities (for locations, see Figure 9). The number of people at risk would vary from 7 million at military targets to the 75 million people who live and work around military as well as metropolitan defense targets (Sullivan et al., 1979). If military and defense targets were attacked, their inhabitants would have to be relocated or protected in-place. In addition, areas lying eastward of targeted areas could expect to receive fallout and would have to take appropriate protective action. Crisis relocation planning for areas near military and defense targets has been given priority, but is not yet fully operational.

In peacetime, an important implication for CEETS is that people in the aforementioned areas should have more motivation to learn about civil preparedness than residents of other locations. Because of their proximity to high risk areas, these populations might be given first priority in receiving training in responding to warning and seeking protection.

c. National-scale attack. In an all-out war between the U.S. and the U.S.S.R. it is believed that the enemy would target weapons on U.S. military installations; military-supporting industrial, transportation, and logistics facilities; other basic industries and facilities contributing to the maintenance of the U.S. economy; and population concentrations of 50,000 or greater (Haaland, Conrad & Wigner, 1976.)

This attack pattern (identified by planners as CRP-2B) would subject more than 125 million people to blast overpressures of 21 psi or more. Their locations are shown on Figure 9 below (which also indicates by arrows those

sites at risk in an attack confined to military/defense targets). Although areas eastward of target areas would receive greater fallout than other areas, most of the country could eventually be affected given the variability of wind patterns at different times of the year.

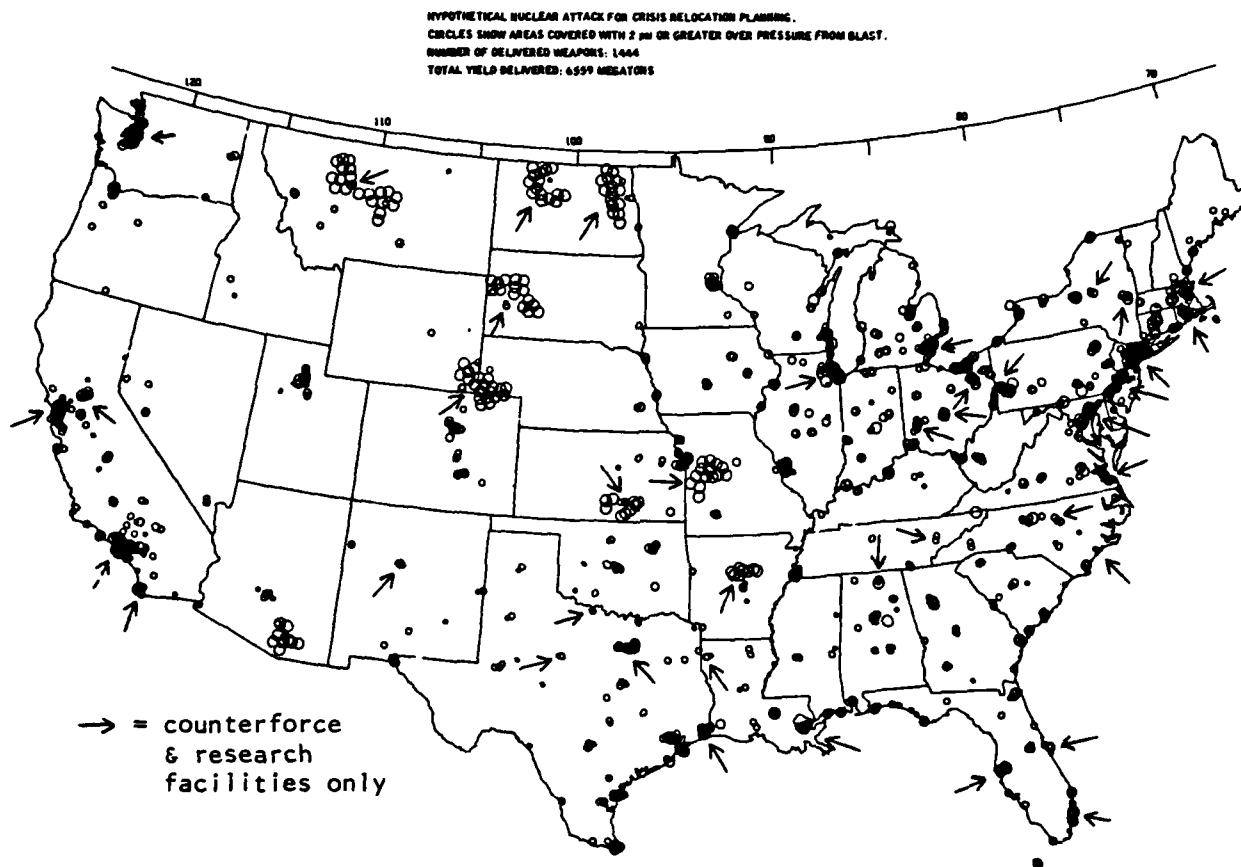


Figure 9 . Risk areas for major nuclear attacks.
(From Haaland et al., 1976, p. 22.)

If 80 percent of the population in these areas were relocated (89.6 million people) approximately 200 miles, they could be accommodated at a ratio of 3 evacuees to 1 host county resident, except for California and the New England states where evacuees might have to go farther or be more crowded (Haaland et al., 1976).

The mass-attack situation is the "worst-case" scenario which the education and training program must be prepared to address. However, even if only a limited attack were imminent, the rest of the population should be prepared to relocate on the assumption that a nuclear war, once started, could easily escalate.

3. Variations in Civil Preparedness

Finally, the ability of a population to survive a major disaster will depend to a great extent on the status of the civil preparedness system. The system's probable effectiveness may be estimated by asking the following questions:

- The CR plan: has a plan been carefully developed that includes specifics about how and what information to give community residents?
- CR experience: has the population and/or local government officials been through CR before? Have agencies practiced for this emergency?
- Warning system: have warning devices been placed strategically and are they operating in an accurate way? Has a system for warning verification been established?
- Communication-information plan: has a plan been developed for keeping the population fully informed? Have reliable sources been established so that the information is accurate and consistent?
- Civil defense system: does the community have a "token" CD system or one with active officials and emergency plans? Does the community have an EOC?

Between the ideal situation, in which all the questions can be answered "yes," and the worst-case scenario, in which all the answers are "no," one might find as many variations in preparedness as there are U.S. communities.

Obviously, the longer the crisis-expectant period lasts, the more time and motivation the nation and its communities will have to develop effective civil preparedness programs. Although a crisis-expectant period may motivate

a community to accomplish a great deal very quickly, it can never quite equal what could have been done by careful planning during peacetime.

a. Fully-developed civil-preparedness plan. If a crisis relocation plan has been developed and is implemented, it is estimated that it could have the following results (Sullivan et al., 1979, pp. 68-69):

- Given one or two weeks' warning, key workers would occupy blast shelters in risk areas. The majority of the population (about 80 percent) would disperse to host areas where they would use existing or newly upgraded fallout shelters. Fatalities could be reduced to about 10 percent of the population as a result of blast effects, and another 4 percent by fallout.
- Given a 24-hour warning, 65 percent of the population might be able to evacuate while others would move to the best available shelter. Some people would be able to upgrade or develop expedient shelters in that time.
- If warning were only 15-30 minutes, no one would be able to evacuate, and 20 percent would be in transit or otherwise exposed. As many as possible would occupy identified shelters or basements (until filled), and the remainder would be caught above ground.

b. Partially-developed civil-preparedness plan. Given the differences in community resources and civil preparedness planning at the beginning of a crisis-expectant period, plans in most areas would probably be in various stages of completion at the time of an attack. Estimates of responses and fatalities for the nation as a whole should therefore be assigned somewhere in between those for a fully-developed plan and the current civil defense situation.

c. Current civil-preparedness status. Based on the conclusions of the System Planning Corporation Study (Sullivan et al., 1979), the University of Pittsburgh Survey (Nehnevajsa, 1979), and other documents, and given current civil preparedness capabilities with no additional development, the situation would probably be as follows:

- Given one or two weeks' warning, between 10 and 40 percent of the population would evacuate spontaneously to the homes of friends or relatives, motels, or the wilderness. If appropriate information is provided, those who stay in risk areas will use and/or improve shelters in their own or nearby basements, or in the most protected space available to them. Blast fatalities would depend on how many people had been able to improvise expedient shelter. Lack of supplies or radioactivity monitoring instruments would increase the number of fatalities occurring after the initial attack.
- Given a day's warning, 5 percent might evacuate spontaneously, the rest would seek the best available shelter. With less than an hour's warning, no one would be able to evacuate. If the attack occurred on a working day, the confusion as families tried to reunite would leave 35 percent still unprotected, while the remainder would go to basements or the best available unimproved shelter. Fatalities might go as high as 55 percent killed by blast, and another 9 or 10 percent due to fallout.

During the 1960's, a program to identify and stock sufficient shelter space for the population was initiated. However, not all buildings with fallout shelter capability provide blast protection, and not all of those buildings identified are still usable. Moreover, according to a survey conducted in the mid-1960's, only about half of the marked shelters were stocked with vital supplies (Bend et al., 1966).

The crisis-expectant education and training system must be prepared to cope with the possibility that civil preparedness planning in a given community will not have been completed when an attack occurs, or that warning time will be too short for all plans to be implemented. In such a situation, people would have to be instructed on how to improvise protection with whatever resources were available.

D. Required Behaviors and the Content of CEETS

The questions of when, where, and for whom the CEET system would be used have been discussed previously. The purpose of this section is to explore the question of what an individual should be able to do in response to a nuclear disaster, and what kind of instruction would enable individuals to carry out these responses effectively.

1. Types of Learning

Bauman (1977) divides learning into three general domains:

| <u>Cognitive</u> | <u>Affective</u> | (Psychomotor) <u>Skill-building</u> |
|---|--|---|
| knowing comprehending applying analyzing synthesizing evaluating | receiving responding valuing organizing characterizing | perceiving having a "set" guided response mechanism complex overt response adapting originating |

These three domains of learning may also be referred to as knowledge, attitudes, and skills.

In order for CEETS to be effective, it must address all three types of learning. Knowledge regarding the nature of the emergency and appropriate actions is a prerequisite to preparedness. An individual must have the skills to respond effectively in an emergency. Finally, the motivation to acquire these skills and to apply them when the time comes may depend on certain attitudes.

2. Focus of Behavioral Objectives

In general, there are two major classes of behavior which must be mastered for emergency response: those understandings, skills, and attitudes which enable the individual to recognize the changed environment produced by the crisis and to act appropriately for personal survival; and those which enable groups of people to work together for both physical and social survival

during and after the crisis.

a. Individual Survival. Studies of human response to natural disasters, technological accidents, and previous wartime experiences have provided a body of experience from which qualified inferences may be made regarding the kinds of behavior needed to cope with the effects of nuclear war. The one behavioral requirement that is continually associated with individual survival in this literature is adaptiveness. According to Dunlap & Associates (1965),

to be effective, an individual's actions will have to be adaptive in three ways: (1) he will be confronted with previously unencountered requirements, and (2) he will have to perform, at least temporarily, certain functions previously performed for him by society, or (3) he will have to adapt to unsatisfied needs. (p.16)

Some of the survival behavioral requirements for the individual noted by Dunlap & Associates include:

- avoiding hazards (radiation, contaminated food and water, disease, injury);
- conserving resources (food and water, clothing, medical supplies, shelter, service materials);
- seeking self-sufficiency in health (energy conservation, sleep, rest, temperature control, mental, first aid); and
- making provisions for dependents. (pp. 18-19)

Perry et al. (1980) examine the response of individuals to the changed environment of a crisis and conclude that preparedness programs act as standby mechanisms for people.

Human behavior in disaster can be conceptualized as nontraditional behavior in response to a changing or changed social and physical environment. In this context, preparedness programs, such as CRP, can be thought of as "nontraditional behavior patterns" (i.e., a standby mechanism) designed to cope with particular changes in the environment which are "called up" in the event of a crisis. (p. 38)

In presenting an image of the process that takes place between the time the warning is received and the response is made, Perry et al. perceive the indi-

reacting by:

- milling, attempting to confirm the warning message;
- milling further, assessing the personal risk; and
- finally, assessing the logistics of making a response.

Only after these actions have been taken does the individual make any adaptive or protective response to the warning.

From the point of view of a crisis-expectant education and training system, some required crisis management behaviors include:

- confirming the warning message;
- assessing the risk to oneself and one's family; and
- assessing the logistics of one's options for responding to the warning.

Perry et al. conclude that it is likely that individuals will comply with the request to relocate if they perceive the threat as real, if they perceive the level of personal risk as high, and if they have an adaptive plan immediately available.

b. Societal survival. Dunlap and Associates (1965) distinguish between behaviors that facilitate individual survival and behaviors that facilitate societal recovery. As elaborated upon by Bobrow (n.d.),

the survival of the United States when nuclear attack is possible does not simply mean preserving lives and property, what we call physical survival. It also means preserving the pieces, i.e., lives and property, in the relationships we associate with the American system, what we will call societal survival. This crude and artificial distinction serves to remind us that physical survival is a necessary but not a sufficient condition for America to continue as a democratic and economically abundant society in the nuclear world environment. (p.2)

Societal survival behaviors mentioned by Dunlap & Associates (1965) that might be the focus of an education and training program include:

- exhibiting a willingness to try to understand national and local post-attack circumstances, recovery plans, and requirements imposed on the public;
- exhibiting a willingness to forego short-term interests of oneself and one's family in order to participate in recovery measures to assure the long-range interests of the group; and
- acquiring the knowledge and capacity to act intelligently and cooperatively to support the recovery of the community. (pp. 21-22)

3. Priorities in Relation to Time

Peacetime and the different crisis-related periods require different types and levels of skills.

a. Peacetime. During peacetime, there will be a few inquiries from some concerned people, librarians and school personnel concerning what to do in a crisis. Information that might be considered appropriate for peacetime includes: (1) directions for constructing or upgrading shelters; (2) detailed instruction on technical aspects of nuclear emergencies; and (3) procedures for training others in various aspects of civil preparedness.

b. Crisis-expectant period. During the beginning of a crisis period, the population begins to be concerned. Most of the population will begin to seek out information about what's likely to happen. Although some training may take place during this time, most of the population will concentrate on gaining knowledge they might need later. This includes:

- knowledge about nuclear possibilities:
 - target areas
 - blast and radiation effects
 - what the protection options are;
- knowledge of how the warnings will be communicated;
- procedures for establishing reliable messages;
- knowledge of how CD operates and of how local government will be functioning during the crisis;

- knowledge of local routes, transportation options, and shelter locations; and
- knowledge of how to begin acquiring supplies for sheltering or relocating.

c. Crisis-activation period. As the crisis progresses, and especially during the height of the surge, the population will need information on what to do and where to go. The information requirements become locally specific during the later stages of the crisis-expectant period and include the following:

- rules for responding appropriately and quickly to warning signals;
- instructions for building a shelter (blast, fallout, expedient) and for upgrading shelters;
- suggestions for stocking shelters;
- knowledge about living in a group shelter;
- knowledge about CRP in general, and destination and route information in particular;
- rules and procedures for solving problems when there is no specialist available, i.e., first aid, radiation/fallout monitoring and decontamination, and fire prevention and suppression; and
- procedures for securing homes.

d. Recovery period. If an attack occurs, the population must be given information and training, both while they are in the shelter and later when they emerge, that will help them to survive in the new world. Behavior requirements for this period of education and training include:

- acquiring the skills necessary to survive in the post-attack environment;
- locating food and water and other supplies;
- assisting in self-government efforts;
- constructing shelters;
- improvising power sources; and

- participating and cooperating in the new way of life.

In addition to the knowledge and skills required to perform the behaviors cited above, members of the U.S. adult population will need to acquire certain dispositions and attitudes necessary for their survival and for the recovery of society. Specifically, they will need to:

- accept responsibility for their own survival;
- believe in the efficacy of protective measures;
- believe that it is necessary to cooperate;
- be willing to share with others; and
- be willing to learn new skills.

4. The Behavioral Model

Table 2 on the next page presents types of instruction divided into knowledge, skills, and affective behaviors. These learning domains are further divided into those areas which should apply to everyone and those which will have to be tailored to meet the needs of specific populations or localities. The information requirements are then presented as training needs specific to the crisis-expectant, crisis-activation, and recovery periods.

5. Content Analysis

Having considered the behaviors which a CEET System should facilitate, foster or train, the following analysis deals with specific instructional content areas. The content to be included in a crisis-expectant education and training system falls into two broad categories: information about what is likely to happen (how CD operates, what a nuclear explosion will be like, what the local emergency plan is, etc.); and information about what adults should do in response to what might happen (how to build and stock shelters, how CR will work, and how to handle problems like medical emergencies, radiation monitoring, and fire suppression).

Table 2

A Behavioral Model of a
Crisis-Expectant Education and Training System

| PERIODS FOR INSTRUCTION TYPES OF INSTRUCTION | CRISIS EXPECTANT | CRISIS ACTIVATION | | RECOVERY | |
|---|---|--|---|--|--|
| | | Relocation | In-Shelter | No Attack | Post Attack |
| Knowledge (The learner needs to understand or to know that...) | GENERAL | <ul style="list-style-type: none"> What to take What not to take What to expect General CRP plan | <ul style="list-style-type: none"> Shelter procedures and rules Fire suppression information Radiological monitoring information First aid information | <ul style="list-style-type: none"> Sources of relief Procedures for return | <ul style="list-style-type: none"> Radiation and fallout effects Finding supplies Organizing to start over |
| | TAILORED | <ul style="list-style-type: none"> Location of local shelters Local evacuation routes Local transportation options People to contact for <ul style="list-style-type: none"> More information Special information What to expect locally e.g., who will give the command Targets | <ul style="list-style-type: none"> Precise shelter locations for all Precise routes Precise transportation options Updated information on what to take Upgrade shelter | <ul style="list-style-type: none"> Transportation routes | <ul style="list-style-type: none"> Current radiation/fallout information Procedures and rules for emergence |
| Operations/Skills (The learner needs to be able to...) | GENERAL | <ul style="list-style-type: none"> Develop a family preparation and response plan Stock a family shelter Administer first aid Respond appropriately to contingencies that may follow Distinguish reliable from unreliable information Build an expedient shelter | <ul style="list-style-type: none"> Formulate plan for shelter entrance Construct expedient shelter Upgrade shelter | <ul style="list-style-type: none"> Upgrade shelter Monitor radiology Formulate family/neighborhood recovery plan Suppress shelter fires Assist in first aid Assist in shelter operations | <ul style="list-style-type: none"> Locate food and water Assist in forming self government Construct new shelter Assess contamination Improvise power sources |
| | TAILORED | <ul style="list-style-type: none"> Follow any special local pre-relocation instructions (e.g., put coded sign on vehicle) | <ul style="list-style-type: none"> As required by shelter manager | | |
| Affective Behaviors (Be disposed to; show attitude of; be committed to belief in...) | <ul style="list-style-type: none"> Accept responsibility for survival Accept value of CRP and CD Believe in efficacy of protective measures Believe in importance of cooperation Show realistic attitude toward consequences of attack | <ul style="list-style-type: none"> Be willing to share Be willing to cooperate | <ul style="list-style-type: none"> Be willing to learn new skills Cooperate | <ul style="list-style-type: none"> Be willing to return to normalcy | <ul style="list-style-type: none"> Be able to adapt to new life Participation Cooperation |

In order to identify the realm of possible content areas, all previous attempts to develop pamphlets, manuals, sourcebooks, etc. on nuclear emergencies were carefully analyzed. The names of these sources and an indication of what content areas they contained is presented in Figure 10. This content analysis as well as a careful analysis of recent technical documents and policy statements provide the basis for the following content listing:

WHAT IS LIKELY TO HAPPEN

- I. A Nuclear Scenario
 - A. How an attack might start
 - B. What would happen
 - C. Risk areas of the U.S.
 - D. A checklist of emergency responses
- II. The U.S. Civil Defense System
 - A. Goals of Civil Defense
 - B. Civil Defense agencies and organization
 - 1. National
 - 2. Local and state
 - C. Comparisons with other CD systems
 - 1. Soviet
 - 2. European
 - D. U.S. Civil Defense policies
 - 1. CRP overview
 - a. Definitions and terminology
 - b. Strategy
 - 2. Shelters as defense: overview
 - a. Public
 - b. Private
 - E. Effectiveness of CD
 - 1. Cost Effectiveness
 - 2. Life-saving effectiveness
 - 3. Attitudes of population toward CD
- III. Nuclear Emergencies and Hazards
 - A. Statistics
 - 1. Weapons advances since WWII
 - 2. Countries possessing nuclear weapons
 - B. Types of Nuclear Emergencies
 - 1. Definition
 - 2. Range of emergencies
 - a. Nuclear testing fallout
 - b. Terrorist activities
 - c. Industrial accidents
 - d. Nuclear war

- C. Effects of Nuclear Weapons
 - 1. Nuclear energy overview
 - 2. Effects of nuclear weapons
 - a. Blast
 - b. Thermal effects
 - c. Radiation
 - d. Fallout
 - e. Health
 - f. Social effects
 - D. Possibilities for survival
 - 1. Time
 - 2. Distance
 - 3. Shielding
 - 4. Decontamination
 - 5. Sheltering
- IV. The U.S. Under Nuclear Attack
- A. Time frames
 - 1. Crisis Period
 - a. Crisis Expectant Period
 - b. Crisis Surge Period
 - c. Crisis Attack Period
 - d. Recovery Period
 - 2. Warning Time Frame
 - B. Warning Systems and Signals
 - 1. Systems
 - a. Ballistic Missile Early Warning System (BMEWS)
 - b. North American Air Defense Command (NORAD)
 - c. National Warning System (NAWAS)
 - d. Community alert
 - e. Official public warnings
 - 2. Signals
 - a. Alert signal
 - b. Attack warning signal
 - c. Responses to attack warning signal
 - 3. Emergency Public Information
 - a. Media involved
 - b. Information given
- V. Survival and Recovery
- A. The country after a nuclear attack
 - 1. The quality of life
 - 2. Public health
 - 3. Industries and utilities recovery
 - 4. Environmental recovery
 - 5. Social systems recovery

RESPONSE TO A NUCLEAR CRISIS

I. The Crisis Relocation Plan

- A. Overview questions
 - 1. Who will go where?
 - 2. How long will it take?
 - 3. Where will people eat and sleep?
 - 4. How long will people stay?
- B. Shelters
 - 1. Public shelters
 - 2. Private shelters
 - a. Permanent shelters
 - b. Improvised shelters
- C. Risk and Host Areas
 - 1. Overview
 - 2. Spontaneous evacuation
 - 3. Those who remain
- D. Direction and Control
 - 1. Transportation possibilities
 - 2. Controlling the relocation
 - 3. Information needs
 - a. Pets
 - b. Medical problems
 - c. Securing the home
- E. Reception and Care
 - 1. Overview description
 - 2. Special problems
- F. CRP in Action
 - 1. Case Histories
 - 2. Community plans

II. The Shelter System

- A. Overview
 - 1. Surveying and Marking
 - 2. Provisioning
 - 3. Managing
 - 4. Organizing
- B. Taking Shelter in the Risk Area
 - 1. Shelter Requirements
 - 2. Improvising Home Shelter
 - 3. Stocking a Home Shelter
 - 4. Finding an Expedient Shelter for Blast Protection
 - 5. Sheltering Outdoors
- C. Taking Shelter in the Host Area
 - 1. Making the host area ready
 - 2. Knowing how to get there
 - 3. Knowing what to take
 - 4. Considering alternatives to the host shelter
- D. Survival in Rural Areas
 - 1. Residential Shelters
 - 2. Animal Shelters

III. Shelter Living

- A. Arrival Actions
- B. Life-support needs
 - 1. Upgrading the shelter
 - 2. Ventilation
 - 3. Sanitation
 - 4. Food and water
- C. Psychological needs
- D. Radiological needs
 - 1. Protection
 - 2. Monitoring
 - 3. Decontamination
- E. Protection against fire
 - 1. Prevention
 - 2. Suppression
- F. First Aid needs
- G. Communications

IV. Life outside the Shelter

- A. National economy
- B. Risk-Area commuting
- C. Social order/disorder

V. Emergence from the Shelter

- A. Precautions
- B. Radiation problems
 - 1. Fallout residues
 - 2. Decontamination
- C. Emergence
 - 1. Temporary
 - 2. Permanent

CONTENT ANALYSIS

| <div> <div>INFORMATION CATEGORIES</div> <div>SOURCE</div> </div> | PFS-Student | Christiansen I | Christiansen II | Bend | ITE | PCR Info. | Materials | PFS-Teacher | Intro. CP | CD Facts | Health | GIE | Guide | Perspective | NHSS |
|--|-------------|----------------|-----------------|------|-----|-----------|-----------|-------------|-----------|----------|--------|-----|-------|-------------|------|
| CD | X | X | | | | X | X | X | X | X | X | X | | | |
| Nuclear Weapons Capabilities | X | X | | | X | X | X | X | X | X | X | | | | X |
| Radioactivity, Fallout | X | X | | X | X | X | X | X | X | X | X | | X | | X |
| Public Fallout Shelters | X | | | X | X | X | X | X | X | X | | X | X | | |
| CRP | | | | | | X | X | | | | | | X | | X |
| Home Shelters (Building, Risk) | X | | X | | X | X | | X | | X | | X | X | | X |
| Shelter Living (Psych. Supplies) | X | | X | X | X | X | | | | X | X | X | | | X |
| Emergency Preparation and Warnings | X | | X | X | X | X | | X | X | X | X | X | X | | X |
| Emergence and Recovery | X | X | X | | | | | X | | | | X | X | | |
| Community Planning | X | | | | | | | X | X | X | | | | X | |
| Rural Shelters | X | X | X | | | X | | X | | | | | X | | |
| Emergency Communications | | X | | | | | | | X | X | | | X | | X |
| Natural Disasters | | | | | X | | | | | | X | X | | X | |
| Shelter Management | | | X | | | | | | | | | | X | | |
| Medical | | | X | X | X | X | | | | | | | X | | X |
| Glossary | | | X | | | | | | | | | X | | | |
| Improvised Shelters | | | | | X | X | | X | | | | | X | | X |
| Fire Protection | | | X | X | X | X | | | | | | | X | | X |
| Soviet CD | | X | | | | | X | | | | | | | | |
| CRP Maps, Risk Maps | | X | | | | | X | | | | | | | | X |
| Special Assistance | | | | | | | | X | | X | | | | | |
| Industry | | | | | | | | | | X | | | X | | |
| EOC | | | | | | | | | X | | | | X | | |
| Law and Order | | | | | | | | | | | | | X | | |
| Citizen Attitudes | | | | | | | X | | | | | | | X | X |

Figure 10. An analysis of content coverage of selected nuclear preparedness manuals.

E. Instructional Considerations

The last factor to be discussed in this analysis is that of how crisis-expectant education and training is to be presented. Out of an array of instructional media, methods, and modes of delivery, those which will be most feasible and effective must be selected. To do this, some of the factors already looked at in previous sections will be reconsidered with respect to instructional options.

1. Audience Options

The first question to be considered with regard to the training audience is how it should be organized for instruction. Some possibilities include the following:

- Adults could be instructed in linguistic groups.
- Instruction could take place in groups that are based on locality, e.g., according to neighborhoods or the location of the shelter they would occupy.
- Audiences could be instructed according to functional interests: that is, those interested in first aid could receive that training, while others would be instructed about stocking the shelter, registering incoming risk-area people, and so on.
- Adults could be educated according to what their family or community responsibilities are. Those with children in schools, for example, might be instructed through that institution, while others might receive training through a community agency or through their place of employment.

A related possibility is based on the idea that a CEET program need not reach everyone directly but could use intermediaries for providing education and training. This would involve training a selected group from the community who would then be responsible for educating or training others during a crisis. In addition, radio and TV station personnel could be prepared to disseminate

information on emergency survival knowledge and techniques over the media during a crisis. Other groups that might be trained to act subsequently as community trainers include (Dunlap & Associates, 1965):

- graduates of civil defense training centers;
- teachers;
- labor and industrial personnel organizers;
- social group leaders;
- Red Cross or other community service agency personnel;
- police and fire personnel; and
- youth activity leaders.

At some point, however, it will be necessary to reach everyone in the population with emergency education. The CEET System should therefore be flexible enough to include content and presentation appropriate for everyone. Local civil preparedness personnel involved in public information and training should be prepared as well to provide locally tailored information and training suitable for the audience in their area.

2. Time Options

By definition, CEETS will focus on the crisis-expectant period. However, for the system to be complete, it should also consider what kinds of training and education might be needed or feasible in the peacetime, crisis surge, and recovery periods.

a. Peacetime. There appear to be both advantages and disadvantages associated with preparing people for an emergency in peacetime periods. Many researchers argue against mounting major civil preparedness campaigns during peacetime. For example:

Some researchers and policy-makers have argued that early dissemination is problematic because: (1) people will forget, misplace, or misunderstand any detailed plan they are given; and (2) distribution of a plan created anxiety over the possibility of disaster or war, and this anxiety will be dysfunctional in an emergency. (Perry, et al., 1980, p. 66)

Civil defense is a low-salience issue, especially because the awesomeness of a nuclear disaster elicits a common popular response to any disaster-preparedness message--the denial of the possibility as long as the environment allows such a denial. (Sullivan et al., 1979, pp. 126-127)

Further, Bend et al. (1966, pp. 19-21) point out that information which is perceived as having little salience has little impact. In several studies, they found that the only people who even noticed the civil defense information being transmitted to them were those who were already interested and favorably disposed toward civil defense.

On the other hand, it has been argued that prior exposure to information about the hazards and responses to nuclear war can increase the salience of information. Furthermore, pre-exposure to emergency plans can sensitize people to those plans and increase compliance during a crisis (Perry et al., 1980). Dunlap & Associates (1965) cite some additional advantages of civil preparedness education in peacetime:

- educational facilities and materials are widely available;
- the population is highly mobile and can reach training facilities;
- the basic needs of the population are already satisfied, freeing their attention for training;
- there are no time constraints on training length or sequencing;
- instructors are available and mobile;
- training can reach people who might leave the area once a crisis approaches;
- trained people can train others during a crisis-expectant period; and
- homogeneous training populations can be identified and reached.

The steady sale of emergency information materials and the continuing interest in survival-oriented courses offered by the Red Cross and other training institutions indicate that there is a small but interested audience for emergency preparedness, even in peacetime.

b. Crisis-expectance. There is general agreement that in a crisis-expectant period, civil preparedness information is likely to be well-received. During this period,

the public at large is more prepared to "tune in" to the civil defense message, and more likely to follow shelter guidance.
(Bend et al., 1966, p. 31)

A study by the Systems Planning Corporation (Sullivan et al., 1979, pp. 127-128) describes public reaction during a crisis-expectant period according to the following sequence of behaviors:

- Stress, eventually reaching very high levels and necessitating new thoughts and/or actions to either explain away or cope with the perceived threat.
- Information-seeking behavior geared to personal survival. The public would seek information allowing people to (a) assess probabilities of the threat, (b) assess personal vulnerability, and (c) determine appropriate personal responses.
- Selection of information sources, based on judgments about (a) the perceived quality and usefulness of information available, (b) familiarity with and confidence in the various information channels available, (c) personal, peer group, kin, and small group experience, (d) the individual's own knowledge, (e) the accessibility of information which appears to address the individual's specific circumstances, (f) the general image and perceived authority of the source, and still other factors relevant to a particular individual's intellectual and emotional condition.
- Coping behavior to relieve stress, including the information-seeking activity itself, rationalizing the threat away, a decision to "wait and see," or activity which the individual believes will (a) remove the threat, (b) provide personal protection, (c) allow escape from the threat, or (d) stimulate a good, collective response with others sharing in the activity.

In a crisis-expectant period, this sequence could recur several times, involving successively larger percentages of the population.

However, it must be recognized that an increase in pressure accompanies an increase in saliency. This places a strain on the resources of the civil defense system at a time when it is already fully extended in implementing crisis plans. Potential problems in delivering crisis training at such a time include the following (Bend et al., 1966, p. 31):

- shortage of time--courses developed for longer periods may have to be squeezed into a few hours;
- difficulty of coordination when so many other activities have to be accomplished; and
- overreaction on the part of some members of the population, leading to dysfunctional behavior and adding to the confusion.

It is absolutely essential that the information which the public receives during such a time be consistent and comprehensible, otherwise the civil defense system may lose essential credibility (Sullivan et al., 1979, pp. 128-129).

c. Crisis and recovery. During the crisis-activation and crisis surge periods, the major items of information would include specific directions regarding what to do and updates describing what is happening. These communications would be necessarily brief and would be distributed on the assumption that receivers already have a certain amount of basic knowledge concerning risks and hazards (Bend et al., 1966).

Education for recovery could take place during the sheltered period and would probably be conducted by shelter managers. Studies conducted during the 1970's indicated that significant portions of the Emergency Broadcasting System (EBS) could be expected to survive an attack (Haaland et al., 1976), and could provide essential information during the recovery period.

3. Options Relating to the Scope of the Education and Training System

A previous section offered a listing of the total content that could be covered by a CEET System. However, it is unlikely that time and resources would be available to cover all topics in a complete fashion during a crisis-expectant period. It is therefore necessary to explore some considerations which might be used to make choices about the nature and scope of the training.

a. Amount of content. Eninger and Fetter (1963, pp. 85-87) present the following three options for choosing the amount of content to include in training:

- (1) The absolute minimum concept. According to this concept, only that content which constitutes an absolute minimum is included in the training content. For example, descriptions of what to do would be included, but details about how or explanations of why would be excluded on the assumption that the person being trained would either know or be able to determine the how or why. This concept would be applied to content selection if the population had only a short time between the warning and the nuclear attack. Only content about what to do would be presented.
- (2) The more, the better concept. This concept holds that the more information given to those being educated and trained (principles, concepts, and procedures), the more fully they will understand the total complexity of the topic. It describes not only the what, why, where, when, and how, but also gives background material. Content about fallout, for example, would include a discussion about how fallout is formed, how particles can cause tissue damage, and how symptoms might occur later than one might expect after exposure to radiation. This content would be in addition to "how to" information about radiation and how to deal with it.
- (3) The minimal requirement concept. This concept is a compromise between the two above options. It includes all topics that relate directly to what the audience needs to know and why, but does not include non-essential background material. The content would include information about how to decontaminate radioactive water, and discuss what might happen if the water is not decontaminated. The topic of why water is contaminated by radioactive materials is not covered, because it is not essential. The critical questions that this concept puts forward are: (1) Does the person need to know this to perform his or her duties and responsibilities effectively? and (2) If he or she does, can it be something prior experience would teach him or her, or should it be included in the education and training content?

b. Proficiency levels. The required level of proficiency affects content choices. It requires less depth of content to familiarize someone with a topic than it does to make that person an expert on the subject. Levels of proficiency include:

- orientation (know about);
- familiarization (know about and know where to find additional information);
- low proficiency (minimal skill level--can carry out task without guidance;
- high proficiency (can perform or supervise the task with little need for guidance); and
- expertise (very experienced in all aspects of the operation and can instruct others).

The levels from orientation to expertise move progressively from less to more content depth.

c. Priority concerns. Related to the concern for depth of content coverage is the question of content priorities. In any period and for any public information message, choices must be made regarding what to include and what to emphasize. The question of priority topics becomes especially salient as the length of preparation time decreases. As noted by Strobe, Devaney, and Nennevajsas (1977),

in slowly-developing disasters, there is relatively ample time for the dissemination of even complex information and instructions. In rapidly-developing disasters, reliance must be placed on the dissemination of that minimal information which is required to lead to effective public response. (p. 11)

Although no discussions of what topics or items of information should constitute a "core curriculum" for CEETS can be found in the literature, priority topics would presumably include: (1) general and local CRP information; (2) procedures for constructing/upgrading shelters; (3) information on risks and hazards; and (4) information on warning systems.

4. Methodological Options

Instructional methods concerns include teaching strategies, media, learning modes and arrangements, instructional sequencing, and instructional resources. Some of these considerations are displayed in the figure below:

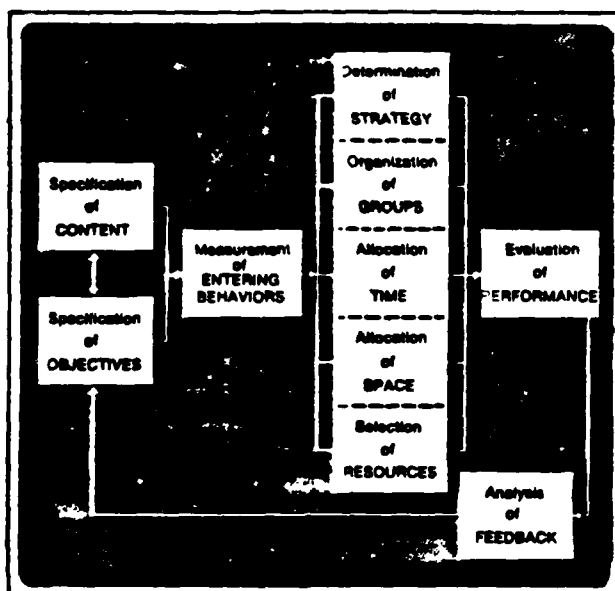


Figure 11. Steps in the design of an instructional system.
(From Gerlach & Ely, 1971.)

a. Teaching strategies. Different strategies are appropriate for teaching knowledge, skills, and attitudes. Bauman's (1977) discussion of the basic requirements for each presents the following ideas (Pt. 4, pp. 69-70):

- **Knowledge**

The basic requirement for altering knowledge (concepts, facts, etc.) is that information be presented clearly, and that the learner have plenty of opportunity for questioning and clarification. In short, the presenter of the information must be able to get feedback on the success of his attempts to communicate. Otherwise, it is unreasonable to expect accurate learning.

Appropriate methods for communicating information include lecture (if followed by a question period), open discussion, listing of questions on cards, etc); symposia (in large meetings) with representatives from the audience present to question a speaker for clarification; films, TV, tape recordings, or readings with the opportunity for analysis by the training group.

- Behavioral skills

Change in the actual ability to do something usually requires guided practice with feedback about the success or failure of the practice. Many people believe that group-relevant skills, such as keeping a discussion on the topic, can be learned by talking about or reading about techniques for coping with particular problems. However, skills must be learned through practice. It is possible to learn all about driving a car by reading a book, but the actual driving can only be learned by doing, by seeing the results, and doing it again.

Methods using video or audiotape recording and playback are helpful for improving skills in group behavior (also helpful are intermittent process analysis, use of a group observer, coaching sessions, critiques of role playing, etc.) as is any method involving immediate analysis of the effectiveness of behavior.

- Attitudes

If attitudes, feelings, or opinions are to be changed, some research suggests that it is important to provide a non-threatening situation where a person can tentatively shift his attitudes without feeling defensive or threatened. In addition, other studies (Cartwright, 1957) indicate that most attitudes are socially responsive; a person holds attitudes as a part of his membership in specific groups (such as a school staff) and more general reference groups (such as "effective English teachers"). The durability of a new attitude is probably a function of whether the learner feels approved and rewarded by an individual or group important to him when he expresses that attitude, either covertly or overtly. In general, the success of appeals to emotion, fear, prestige, or credibility as a means of opinion change is variable. A frequent finding is that the "sleeper effect" occurs--initial opinion changes are not durable; opinions often revert to their original level after some time has passed.

If attitude change is desired, it is appropriate to utilize small, informal, open-ended discussion groups where the individual will not feel threatened. To the degree that these discussion groups are important or valuable to the person, attitude changes are more likely to be durable.

Other training methods that are helpful for bringing about attitude change include interview situations in which one member listens carefully to another member's description of his job attitudes and problems, and role playing. Role playing can be especially helpful in attitude change because the learner actually experiences the new attitude, feels little threat, and is supported by other members of the training group.

The criteria for selecting an instructional strategy should also take into account the following:

- (1) the type of instructional objective (e.g., information learning vs. principle learning);
- (2) the context for the criterion task (e.g., filling out a form vs. organizing a team of people);
- (3) the nature of the learners--their personal characteristics, experience and present circumstances; and
- (4) the constraints imposed by the context in which the instruction will take place. Types of constraints include:
 - a) time--when (peacetime, increased readiness, crisis surge, in-shelter period); amount available (one or two days, semester course, on-the-spot training);
 - b) location--formal institution, informal setting, in the shelter;
 - c) nature of trainers--managerial/technical/interpersonal expertise; need for guidance, materials, props, etc.; volunteer or compensated;
 - d) number of persons to be trained--trainer/trainee ratio; size of instructional groups; availability of adequate facilities, etc.; and
 - e) financial considerations--compensation for trainers/trainees; cost of materials/equipment; costs of using facilities.

Stated differently, selecting an instructional strategy is a matter of maximizing the following criteria:

- (1) Effectiveness: How well can the method achieve the instructional objective?
- (2) Efficiency: Does the strategy get the most out of the available resources?

- (3) Suitability: How appropriate is the strategy for the trainees, the training context, and the criterion task content?
- (4) Feasibility: Given the constraints that have been identified, can it be done?

b. Media choice. The population will want information quickly and will need specific information presented in the most understandable, memorable way. The medium must be able to satisfy these needs. Given the range of media possibilities for the education and training of adults during the crisis period, some consideration must be given to the selection of media. Gerlach and Ely (1971) suggest the following criteria for selecting appropriate media (pp. 292-296):

- (1) Appropriateness: Is the medium suitable for accomplishing the purpose of the instructional event?
- (2) Level of sophistication: Is the medium on the correct level of understanding for the learners?
- (3) Cost: Does the potential learning from this medium justify its cost?
- (4) Availability: Can the material and equipment be readily available when they are needed?
- (5) Technical quality: Is the quality of the material acceptable--easy to read, easy to see, easy to hear?

Level of sophistication, for example, is considered by Dunlap and Associates (1965) in their recommendation that all printed materials stockpiled in shelters be designed for a sixth-grade reading level. "While this would result in approximately 10-15 percent of the nation's populace not being able to use the materials, it seems logical to expect that most of the vital facts could be presented through verbal means to such persons" (p. 65).

Perry et al. (1980) underline the importance of the media choice in maintaining that the medium of the warning message influences the hearer's action. Accordingly, when the medium is viewed as authentic and the threat

is perceived as real, more people are likely to act upon the warning. Perry et al. warn, however, that the message must be clearly presented:

In a situation where the President of the United States announces the warning to relocate and newspapers publish full page evacuation instructions, one could easily argue that the source was unimpeachable and would contribute positively to a definition of the threat as real. This result is not necessarily always the case. For example, during the nuclear power plant accident at Three Mile Island, Pennsylvania, warnings (with nuclear messages) which were often contradictory were issued by a variety of presumably authoritative officials and the result was general confusion (Nuclear News, 1979; 1-6). For the warning source to have the desired effect of enhancing warning belief, the source must be perceived as reliable and the warning message must be clear and logical in any action it suggests. (pp. 44-45)

Perry et al. further suggest using the broadcast media of radio or television for transmitting warnings because these media are more easily updated than are newspapers. However,

It is important . . . that the station be officially designated as the community's source for emergency information and that the public be aware of this designation. Establishing credibility of the information source can be nearly as important as the information disseminated. (p. 70)

The current civil defense plan is to broadcast over mass media the President's explanation for the order to relocate. Specific details such as routes, destinations, and protective action will come from state and local civil defense officials in verbal modes while maps and other visual information will be placed in newspapers.

c. Learning arrangement. The possibilities for grouping and assembling learners are seriously restricted by the crisis context within which instruction must take place. During an extended crisis-expectant period, some provision for group instruction or team learning might be possible. Such arrangements might be especially valuable when concerted community actions are needed, i.e., evacuating an institution, upgrading a lodging facility, or coordinating transportation.

Otherwise, the principal learning arrangement for CEETS will have to be individual, home learning by way of reading materials and mediated messages. Family-focused instruction and guidance materials directed to one family member who instructs other members is also a possibility.

d. Evaluation. Ultimately, the proof of the education and training system is in the pudding of a crisis. If the system is successful, that is, if learning takes place, then the population will act in the best way to insure their survival and the survival of society. As Dunlap and Associates (1965) point out,

any measure of effectiveness regardless of how reached, would be an estimate of the degree to which the purposes of training had been achieved specifically: (1) how sensibly and skillfully individuals observed the basic rules of biological survival; and (2) how willing and enlightened was public support of and participation in community recovery measures. (p. 71)

Because it is not possible to evaluate the effectiveness of nuclear preparedness training in an actual performance situation, lesser disasters may be examined to determine what the value of education and training was/is. The evaluation may be made by examining: (1) the expected results if no education and training takes place; and (2) the expected results with education and training. These evaluative questions may be applied to the present situation as well as past disasters.

In examining our present society in light of the above two questions, Dunlap and Associates (1965) state the following conclusions:

Knowledge of much of the common sense of survival techniques is widespread in the normal conditions of society, but there would be serious gaps in areas beyond common experience; i.e., radiological contamination, "wilderness" survival techniques, etc.

The effect of failure of individuals to possess, or to acquire adequate knowledge of survival techniques would have a significant impact on societal recovery processes both through diversion of scarce resources and from morale considerations. (p. 73)

Stope et al. (1977) considered the question of whether preparation is important in a population's disaster evacuation response and found:

Evacuation of people from danger areas has been routinely successful, even when specific plans for them had not been made in advance.

Existence or lack of a plan is most often noted in afteraction comments on disasters and improvements in a plan are often recommended by officials and observers. Next most common are recommendations for improvements in equipment and infrastructure. Also noted were exercises of the emergency organization, but in no case was public participation in drills noted or recommended.

Intensive efforts to inform the public on evacuation plans and procedures have had limited success. (pp. 13-14)

If a training program were to be implemented during peacetime, methods have been suggested for evaluating its success. Bauman (1977) lists four possible elements in the training evaluation:

- Reaction: How well did participants like the program?
- Learning: What principles, facts, and techniques were learned?
- Behavior: What changes in behavior resulted from the program?
- Results: What tangible results did the training have on the overall program? (Pt. 8, p. 3)

Skills that participants learn during peacetime training sessions can be evaluated through the use of such techniques as demonstrations, role playing, and simulations. Learning can be measured quantitatively through pre- and post-tests administered to participants. Any evaluation would have to incorporate the opinions of participants, some objective examination of knowledge gains, and some performance evaluation.

5. Delivery Options

According to Dunlap and Associates (1965), time is the most important element in the transmission of crisis-related public information. They suggest that training materials be "on hand ready for use prior to actual crises situations" and offer two suggestions for these packages: a home disaster guide,

"similar to the poison guide, or first aid booklet which is found in many homes;" and mass media materials, including:

- newspaper articles (series extending through crisis period);
- educational television presentations;
- radio programs directed toward individual countermeasure activities; and
- special news presentation of similar disaster situations (presented over television networks). (pp. 51-52)

Distribution of the home disaster package could be achieved by using supermarkets, local mailing lists, school children, or welcome wagons. Dunlap and Associates note that "such home packages, even if not read upon receipt, would serve as ready references for possible future use" (p. 52). Other media that might be used to transmit the necessary information to the public include:

- sirens;
- loudspeakers/public address systems;
- skywriting;
- radio announcements or programs;
- TV announcements or programs (cable or network); this could also be voice-over messages or subliminal titles;
- movie announcements, voice-overs, newsreels, or cartoons;
- newspaper announcements, headlines, news stories, features, supplements;
- books, pamphlets, magazines;
- handbills;
- billboards and signs in public transportation vehicles; and
- advertisements placed where they will be read--in newspapers, programs, on consumer products, etc.

Individual messages can be delivered through the mass media and/or in other ways. Handbills, for example, can be included in newspapers, delivered door-to-door, or passed out on street corners. It is also possible that

something developed for use by one medium can be used by another. Movies can be viewed at home on video equipment; TV programs can be recorded and viewed by others; voice-overs from a TV program can be used by radio stations, etc.

Delivery issues of relevance to training systems in general and to the CEETS system in particular are not limited to how to transmit the message.

Additional delivery concerns include:

- how to provide for the guidance and practice necessary to teach such skill-laden competencies as constructing expedient shelters;
- how to provide for the expansion of the CEETS system between and within crisis time periods;
- how to provide for the refinement and tailoring of CEETS materials and procedures to fit special audiences and contexts;
- how to provide for the immediate activation of the CEETS system in a crisis situation;
- how to establish a dissemination capability for CEETS messages and materials;
- how to insure that the CEETS system undergoes continued monitoring and evaluation; and
- how to institutionalize the system within larger more stable and credible systems such that the CEETS system becomes an integral part of the total emergency management system.

Options and considerations for satisfying these delivery requirements and for institutionalizing a crisis-expectant education and training system are absent in the literature. Agencies such as the American Red Cross because of its national focus and community colleges because of their mandates for public information may constitute prime candidates for carrying out training delivery.

CHAPTER THREE

A MODEL FOR A CRISIS-EXPECTANT EDUCATION AND TRAINING SYSTEM

The analyses presented in the previous chapter will provide the basis for describing requirements of an education and training system in this section of the report. Education and training components based on these requirements will then be identified, together with procedures and arrangements for their use and evaluation. Figure 12 displays the process by which input information is used to develop the CEETS model.

The design process displayed in Figure 12 can be briefly characterized as follows. First, two types of need-related information are collected: training needs based on audience characteristics and situational factors; and training needs based on time and training context factors. Next, two types of information on instructional options are collected: salient (i.e., survival-related) knowledge, skills, and attitudes which constitute possible instructional objectives; and instructional strategies which might be used for presenting the education and training content.

A discussion of these input factors and possibilities was presented in the previous chapter. What remains to be done is to convert need-related information into system requirements and to display instructional options in a profile. Options are then selected according to these requirements, as well as to the demands of the three alternative training periods described in Chapter Two. The result of this step is a general image of three training configurations matched to probable education and training situations.

At this point, these three configurations might be elaborated upon. However, for the purpose of the present project, this step will be eliminated in favor of the specification of a composite model, that is, the specification of materials, procedures, and arrangements appropriate to the demands

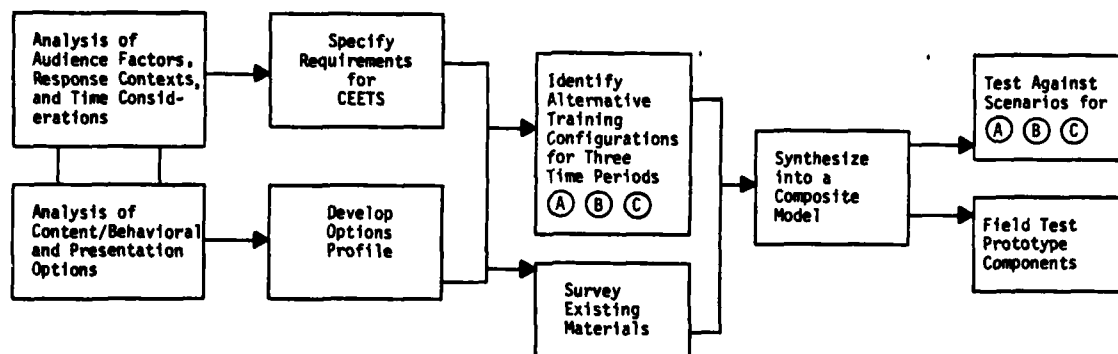


Figure 12. Steps in modeling the Crisis-Expectant Education and Training System

and requirements of all three of the most probable training situations. A final section presents recommendations for future directions with regard to: the development and testing of components specified in the CEETS model and the design of procedures and arrangements for the delivery of these components.

A. Requirements for CEETS

Chapter Two provided a detailed description of the education and training requirements for CEETS. These requirements may be divided according to the following categories: audience, context, manner of presentation, and manner of delivery.

1. Audience-Related Requirements

In considering the audience, the CEET System must address all U.S. adults. This is a major requirement in light of the size and pluralistic nature of the U.S. The usual problems of varied languages, reading levels, and interests are compounded in this instance by variations in crisis-related environments, resources, knowledge of civil defense, familial responsibilities, and psychological make-up. All these factors will have

direct effects on people's need for information and training and on their willingness to accept and/or benefit from instruction. At the very least, CEETS must:

- be adaptive to the most common crisis-related needs, e.g.,
 - directed evacuation from risk areas
 - relocation within host areas
 - spontaneous relocation
 - non-evacuation in a risk area
 - hosting in a host area;
- address common familial responsibilities and requirements for evacuation and sheltering;
- be satisfactory for people who are sophisticated about civil defense and nuclear hazards in addition to those having no knowledge in these areas;
- be adaptive to people who evidence common variations in personal resources such as
 - transportation
 - ambulatory ability
 - money (for the purchase of supplies)
 - possession of radio or TV;
- address potential and assigned leaders and people who will or may adopt crisis relocation responsibilities; and
- address common psychological barriers to effective crisis actions.

2. Context-Related Requirements

Three context factors were explored in Chapter Two: the (time) period during which the system is activated; the nature and extent of the anticipated emergency; and a community's civil preparedness capability. As a result of these analyses, a number of requirements emerged. Accordingly, CEETS must:

- be adaptive to both extended crisis periods, contracted crisis periods, and crisis activation that occurs without a crisis-expectant period;
- not only be adaptable to different situations, but it must also be expandable once activated;

- be adaptable to common variations in civil defense readiness and be capable of being updated as changes and improvements in civil defense capabilities and planning are made; and
- focus on the knowledge and capabilities that everyone everywhere must possess while insuring that information tailored to particular locales reaches the CEETS audience along with this general information and training.

3. Presentation-Related Requirements

The following are presentation considerations that are important for the design of CEETS:

- Most of the content to be presented by CEETS is information which may be transmitted through any or all of a variety of media.
- There are a few topics for which skill training is required and others that could benefit from practice; for these areas, some provision for guided practice must be made.
- The system would benefit from but cannot rely upon the presence of trainers, the continued operation of the media, or written materials alone. Therefore, self-instructional booklets as well as multi-media messages must be incorporated into the system for all important content areas.
- The presentation strategy must foster the attainment of the necessary knowledge and skills, and must also facilitate the attitudes and dispositions necessary to apply those knowledge and skills.

4. Delivery-Related Requirements

"Delivery" refers to materials, arrangements, and procedures for facilitating the institutionalization and use of the education and training materials. A preliminary analysis reveals a number of delivery requirements that may affect the form of the education and training system:

- the system should be self-activating, that is, it should respond to an emerging crisis situation "by itself" without the need for some executive order;
- the delivery system should be expandable, that is, as the crisis becomes more serious, the number of people reached and the number of messages deployed should increase;
- the system should be self-monitoring;
- the system must be capable of providing limited training for all and extensive training for some;

- the system should be couched within an organization or agency that has maximum credibility; and
- redundancy should be built in.

B. A Profile of the Options Available for CEETS

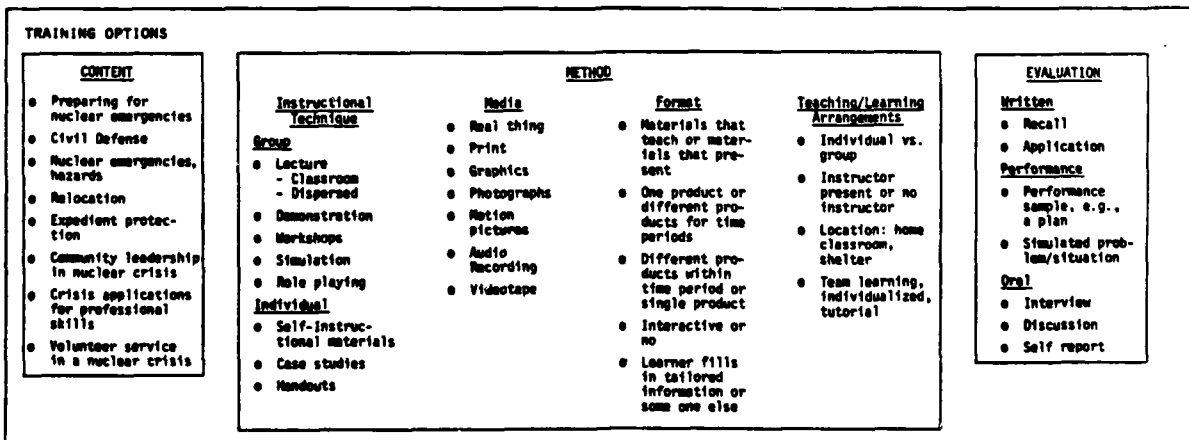
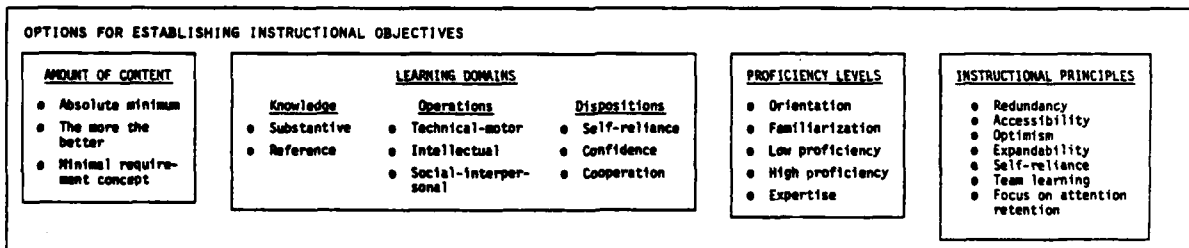
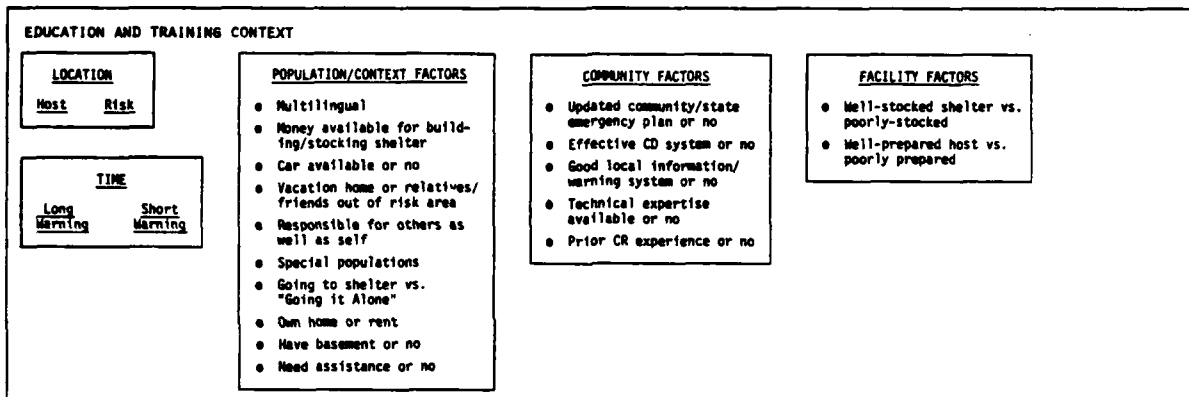
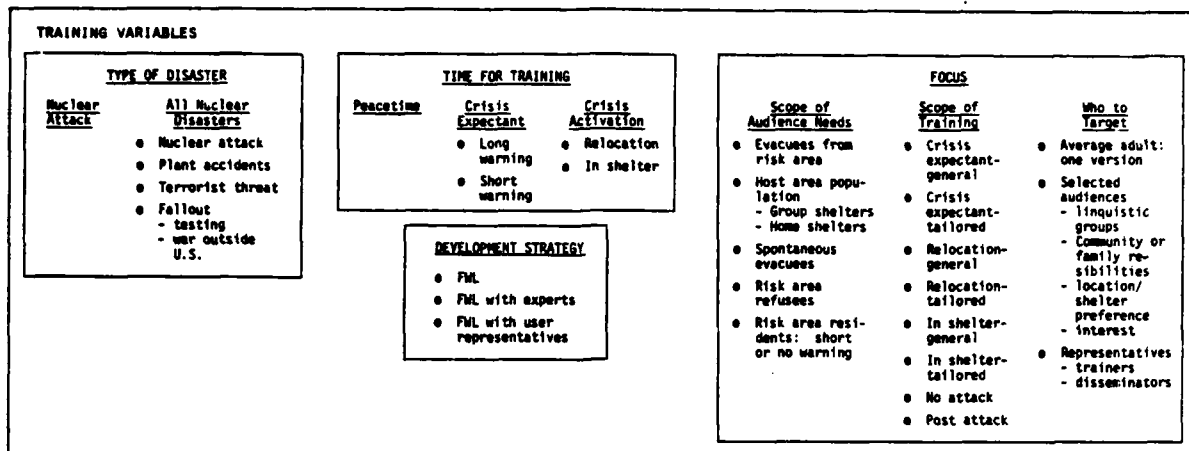
The system requirements reviewed above provide the criteria for the design of the CEET System. However, there are still a great many options within these constraints. Options revealed in the course of the analyses that contributed to Chapter Two are presented in Table 3 in the form of an options profile. An options profile is a conceptual device employed by a designer to manage complexity. It provides an easily accessible summary of all the major choices, considerations, and factors that might influence or enter into the design of a training program. From an analytical perspective, the profile may be used to classify and describe relationships among items. From a synthetic perspective, the profile allows the designer to test design configurations for completeness and to generate ideas for new configurations.

The options profile for a Crisis-Expectant Education and Training System displayed in Table 3 has four major dimensions:

- Training Variables. These variables refer to the basic factors which establish the scope of the training--who shall be trained, when shall training occur, and what should be the purpose of the training?
- Education and Training Context. This dimension narrows the focus of the design by identifying factors in the training context which limit the training possibilities and/or suggest options for training. These factors include the location of the population, the time when training occurs, specific characteristics of the audience which should be considered, and characteristics of the community and the sheltering situation which will affect what the audience will need to know.
- Options for Establishing Instructional Objectives. These options represent design possibilities which must be considered before choices about content and methodology can be made. Decisions in this category include the optional amount of content to be transmitted, the relative emphasis to be given different learning domains, the level of proficiency trainees should achieve, and the training design principles which the materials should feature.

Table 3

Options and Context Variables for a Crisis-Expectant Education and Training System



- Training Options. Training options establish the possible forms that the "curriculum" will take with regard to content, instructional techniques, media, format, learning arrangements, and method of evaluation.

C. Alternative Configurations for Training and Delivery

It is not possible to define with any certainty the ideal or typical situation in which a Crisis-Expectant Education and Training System would have to be used. In modeling such a system, the demands and requirements of a wide variety of possible situations should first be considered based on existing scenarios and estimates (e.g., Brown, 1976; Sullivan et al., 1979). Defining the kind of education and training system that would be most appropriate for situations along a continuum of possible situations constitutes a first step in the modeling of a system applicable to all situations.

It is apparent that the one factor which is most responsible for variations in the training context is time. As time for training and other crisis actions decreases, the "degree of freedom" for training programs decreases as well. From a design point of view, this means that the designer's ability to specify the training situation increases as the amount of time projected for training increases. If these two factors are placed at the two ends of a continuum, one may identify a number of hypothetical situations for education and training as displayed in Figure 13 below.

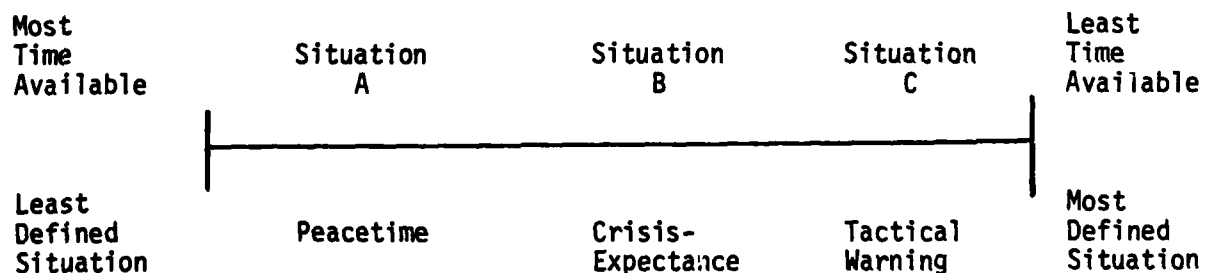


Figure 13. Three training scenarios.

1. Peacetime (situation A)

Peacetime may be defined as the "normal" situation, although there has been no time in recent years in which the potential for a major crisis has not been apparent. From that point of view, all periods are crisis-expectant. In "peacetime," however, the majority of the population remains unconcerned with threats and crises. Those who do see the need for civil preparedness constitute the natural audience in this period for peacetime training.

Since the peacetime training group is self-defined, materials must be available which individuals or groups may have on demand and use by themselves. Booklets, homestudy courses, and group based or trainer-managed instruction are among the possible formats for peacetime instruction. Materials should direct the user to opportunities for further training and/or participation in the civil preparedness system.

Peacetime is also an ideal period for civil preparedness planning and program development. Any plans which will involve identifiable groups (such as industries involved in organizational relocation planning) should include an education component. In addition to general preparedness information, people in these groups will need to know how their organizations are expected to participate in local emergency response activities.

Another function which the education and training system ought to perform in peacetime is that of laying a groundwork of general information upon which specific and concentrated knowledge can be built during a crisis period. As noted by Sullivan et al. (1979),

the fundamental purpose of such a strategy is to achieve and maintain a maximum cumulative effect. Given a certain proportion of interested people, CD seeks (1) to reach them with the maximum acceptable amount of information and (2) to ensure that the people thus reached are "retained" in the system so that their knowledge can be used at a later stage. (p. 133)

A comprehensive attempt to provide nuclear preparedness education to all Americans during peacetime is not recommended. A number of studies have pointed to the unwillingness of the general public to receive detailed information about civil preparedness in peacetime (e.g., Bend et al., 1966). Furthermore, at this moment in the development of the civil preparedness system, it might be unwise to attract public attention to the civil preparedness program while planning and implementation activities are still incomplete.

On the other hand, it might be desirable to prepare the public for subsequent training by providing some basic information about the existence and purpose of the civil preparedness system in an unobtrusive and attractive way. Occasional TV or radio spots and programs, articles in newspapers, or public service posters in stores and post offices could all be used. If properly done, these approaches should increase the credibility of the civil preparedness system.

2. Crisis-Expectance (situation B)

A second situation in which crisis-expectant education and training would be needed is a period of rapidly increasing international tension during which emergency response plans are being implemented and public anxiety (and therefore receptiveness to the civil preparedness message) is high. The education and training provided in such a period should be coordinated, comprehensive, and varied so that a consistent and credible message will reach as many people as possible. Radio and television should be used because of their accessibility, particularly for local information, and for providing up-dates on developing civil preparedness plans. Television is especially useful for presenting skills for which a visual example is necessary. Newspaper articles can also be prepared and disseminated and are almost as immediately responsive to changing local information.

The media should be backed up by printed materials varying in length from handouts such as a checklist to an informational pamphlet. It would also be desirable to have materials available which show community leaders and emergency service personnel how to support and extend the general educational effort.

The dissemination of public information and educational materials should be closely coordinated with the implementation of other civil preparedness plans. Public announcements must be clear and accurate and indicate where people can seek further information.

3. Tactical warning (situation C)

This is the least likely situation, according to defense strategists. However, as long as a surprise enemy attack (or sudden nuclear emergency from other causes) is a possibility, it must be provided for. In this scenario, the emergency situation arrives either with little warning, or much sooner than expected. The amount of public information that could be provided would depend to a great extent on whether the crisis occurred during the day or the night. It is estimated that the current network of sirens could alert perhaps 50% of the population during the day and hardly anyone during sleeping hours (Sullivan et al., 1979). These estimates could be considerably improved by implementation of a high-performance home warning system such as the Decision Information Distribution System (DIDS).

Given effective warning procedures, there would then be a need for instant, accurate information on the nature of the threat and what to do about it. This could be accomplished by providing radio, TV, and telephone systems with pre-recorded announcements based on local emergency-response plans.

Since a tactical warning situation would not allow enough time for crisis relocation, the population would have to respond to the warning by seeking protection in public shelters or their own homes. Public shelters should be stocked with materials which the shelter manager could use to train assistants and to educate shelterees about weapons effects, shelter living, and recovery.

For both public and private shelters, the radio would serve as a major channel for information. Civil defense communications staff should therefore be provided with nuclear preparedness information (messages, instructions) which could be transmitted through this medium. These messages and instructions should duplicate the content included in printed material.

Non-risk areas would have a slightly longer time between the attack warning and the actual arrival of fallout in their areas. This time could be used for a last-minute educational effort oriented to fallout protection. Here, again, the primary medium of transmission would probably be the radio.

D. Past and Present Public Education Materials for Civil Defense

Before addressing the design of a new system to educate the public to respond to a nuclear crisis, it is important to identify efforts that have already been made in this direction and to consider them as sources of content, examples, and potential components of the system. Table 4 displays a sampling of relevant materials.

Table 4

Sampling of Materials Relevant to Public Education
for Civil Preparedness.

| Source | Title | Content | Usefulness |
|--------|---|--|---|
| DCPA | Protection in the Nuclear Age (1977a) | Manual-warning, shelter, relocation | good format; good material on relocation |
| DCPA | In Time of Emergency: A Citizen's Handbook on Nuclear Attack, Natural Disasters (1976b) | | |
| | . handbook | hazards and response for nuclear war and natural disasters | succinct text & check-lists; no info on CRP |
| | . presskit | already typeset news articles on hazards, CRP expedient shelter, etc. | articles need some updating; need sample formats for local info. |
| | . radio kits | test for radio spots & prerecorded messages | need updating |
| | . 28 minute film | | (not reviewed) |
| | . information sheets (booklet) | hazards, shelter, CRP, etc. | booklet needs directions for use, distribution |
| | . family action workshops (handouts & questions) | nuclear emergencies, tornadoes, food emergencies, protecting property, community disaster planning, helping children face crisis | add material on CRP, relocation, hosting evacuees |
| DCPA | Information Bulletin: Materials for Presentation on Nuclear Civil Protection #606 (1976c) | narrative and masters for transparencies on CD policy and rationale | needs update; good source of transparencies |
| DCPA | Introduction to Civil Preparedness (1975) | introduction for new CD directors on hazards, CD program, resources | good description of CD program; no info. on CRP |
| DCPA | Personal & Family Survival, Civil Defense Adult Education Course, Student Manual (1966) | manual & handbook- CD adult ed. course to be delivered by State Depts. of Education on nuclear civil preparedness | needs updating; films would be useful if available, transparencies good |

Table 4 (cont.)
Sampling of Materials Relevant to Public
Education for Civil Preparedness

| Source | Title | Content | Usefulness |
|-------------------------------|---|--|--|
| DCPA | Radiological Defense Manual (1977b) | characteristics, effects monitoring of radiation | stock in shelters |
| DOE (Kearny et al.) | The KFM, A Homemade Yet Accurate and Dependable Fallout Meter (1978) | report on development & testing of home-made fallout meter, masters for instructional manual | make booklet available as part of CEETS |
| DCPA (Kearny) | Nuclear War Survival Skills (1979) | explicit instruction on expedient shelters, etc. for individual or family self-protection | good as information source and for use by motivated members of public |
| DCPA (Kearny) | How to Make and Use a Homemade, Large-Volume Efficient Shelter Ventilating Pump (1972) | directions for building a shelter air pump | make available to those building own shelters |
| DCPA (Brown) | The Nuclear Crisis of 1979 (1976) | scenarios of crisis-expectance, relocation, recovery | good source for teaching, motivation |
| DCPA (Christiansen et al.) | Guidance for Sharing Residential Space during Emergencies (1979) | report and manual on effects, preparedness for families and households | overwhelmingly comprehensive, up-to-date, good on rural shelter & recovery |
| DCPA | Industrial Civil Defense, First Steps to Company Survival (1965) | Worksheets for analyzing protection needs, procedures for protecting | needs updating; e.g., info on hardening, ORP, good format |
| DCPA | pamphlet series for architects, builders, engineers | covers principles of building design and adaptation for energy conservation & nuclear protection | good motivator for use in peacetime; make parts of CEETS |
| DCPA & DOD (Byrne & Bell) | Livestock, Fallout, & a Plan for Survival (1973) | pamphlets-effects of radiation on livestock, protective measures | make part of CEETS |
| DCPA, PTA & DOD | Civil Defense, a Vital Concern to the PTA (1969) | how PTA can help schools upgrade protective capabilities for in-place shelter | no allowance for time periods, CRP; good example of a booklet for a voluntary organization |
| DHEW | The Role of the: Veterinarian, Pharmacist, Dentist, in National Disaster (1964) | three reports analyzing how non-M.D.s could aid CD efforts | good sources for development of pamphlets |
| ERDA | Emergency Handling of Radiation Accident Cases: for Hospital Administrators, Physicians, Ambulance personnel (1975) | pamphlets stress avoidance of contamination | seems superficial; needs to be related to wartime as well as peacetime context |

Table 4 (cont.)
Sampling of Materials Relevant to Public
Education for Civil Preparedness

| Source | Title | Content | Usefulness |
|--|---|--|--|
| U.S. Dept. of Transportation | Hazardous Materials Transportation (n.d.) | Seminar materials - definitions, regulations personnel duties, labels & packaging (includes radioactive materials) | source for development of pamphlet? |
| ERDA (Brannigan) | Living with Radiation (1976) | booklet on hazards of industrial radiation | good source for people living near reactors; done in layman's language |
| Leadership Resources Inc. (Moore) | If Disaster Strikes: A Book of Games for the Teaching of Individual & Community Preparedness (n.d.) | 35 CD teaching games for infusion into Social Studies curriculum | some games could be adapted for adults |
| Washington State Dept. of Emergency Services (Stoffel) | Emergency Preparedness Today (1976) | survey of hazards & skills skills for natural & nuclear disaster (minor) | good illustrations and style; directions for emergency kits |
| Survival Education Associates (Fear) | Teaching Survival with Graphics in Survival/Disaster & Outdoor Comfort Education (1978) | catalogue of teaching guides with transparencies stresses positive attitudes | good format & visuals |
| Survival Education Associates (Fear) | Surviving the Unexpected Wilderness Emergency (1975) | preparedness for psychological and physical effects; living off the land | good for individualists |
| Brigham Young University Press (Thygeson) | Disaster Survival Handbook (1979) | survey of disasters & responses, general skills | good source for generalizable survival skills |
| Harper & Row (Greenbank) | The Book of Survival; Everyman's Guide to Staying Alive and Handling Emergencies in the City, the Suburbs, and the Wild Lands Beyond (1967) | odd mixtures of advice on responding to every conceivable emergency; stresses improvisation, motivation | strange format; keep in car; shelter, etc. |

Existing materials with relevance to public education and training for crisis preparedness fall into several categories. First, there are those materials which were developed for distribution to the general public in a peacetime or crisis-expectant period. The most relevant of these materials is the series entitled In time of Emergency, (DCPA, 1976b) which consists of a short handbook coordinated with public information materials for various media. One problem with this series is a lack of information on crisis relocation. Another is that there is no provision in the printed materials for including specific information on local plans. Also, little attention has been given to the delivery of the materials or to their coordination with other crisis response activities.

In addition to DCPA sponsored programs, a number of privately developed materials on disaster preparedness and wilderness survival are available which include information on responding to nuclear attack. These books are intended for the self-motivated reader and address survival at an individual and family, rather than at the community, level.

Another major grouping consists of materials which are addressed to members of the public according to professional roles. Examples include manuals for farmers and stockmen, human service workers, architects and builders, dentists, veterinarians, and factory managers. Some are intended for infusion into professional training programs, while others are meant for orienting in-service professionals to possible emergency responsibilities. These are extremely important, since survival, and certainly recovery, will depend in many cases on the ability of people from different areas of expertise to apply their skills.

E. A Composite Model for Crisis-Expectant Education and Training

A basic goal of CEETS is that education and training should be provided to all adult Americans in a crisis situation. However, existing resources are not sufficient to provide materials and messages tailored to all possible situations and needs. A provisional solution is to develop a system of products and procedures which are oriented to the most common information and training needs and which are constructed in such a way as to be functional in more than one situation and time period.

Components of such a system are listed in Table 5 below. Three basic product types are featured: core modules, media modules, and special purpose modules, each with its own purpose and format.

1. The Core Modules

Core modules are booklets which would present the most essential and generally applicable information about preparing for and responding to a nuclear emergency in a succinct and readable form. The modules should be short, illustrated, and written in a simple but attractive style. Each booklet should focus on a different content or skill area, yet there should be sufficient redundancy across the booklets to insure that crucial information is conveyed by each and every booklet.

The modules would be available for distribution by FEMA in peacetime and would form the backbone of a public education program in a crisis-expectant period. For these reasons, the modules should be both integrated and separable, with each booklet having some kind of summary of the most important information in the form of a checklist. The following topics for core modules have been identified:

Table 5 A Composite Product Model for CEETS.

| SPECIAL PURPOSE MODULES | CORE MODULES |
|--|--|
| <ul style="list-style-type: none"> ● Preparing for Nuclear Emergencies (an adaptation of the overview core module for the 4th grade reading level) ● Crisis Checklist ● Core Modules (minority language versions) ● The Role of the [<i>e.g., community leader</i>] in a Nuclear Emergency (a series of modules addressed to different professions) ● Guidance for Sharing Residential Space During Emergencies (an adaptation of Christianson, 1979) ● The K.F.M. (Kearny) How to Make a Shelter Ventilating Pump (an adaptation of the DCPA radiological defense manual) | <ul style="list-style-type: none"> ● Preparing for Nuclear Emergencies ● Civil Defense in the 1980's ● Nuclear Emergencies and Hazards ● Preparing to Relocate ● Preparing for Survival |
| | MEDIA MODULES |
| | <ul style="list-style-type: none"> ● Nuclear Emergency News <ul style="list-style-type: none"> -- Press Kit -- Radio Resources Kit -- Television Kit ● Nuclear Emergency Media Kit |
| | SUPPORT MODULES |
| | <ul style="list-style-type: none"> ● Managing Public Education and Training in a Nuclear Emergency ● Crisis Assistance Manual ● A Nuclear Emergency Manual for Community Leaders |

- Preparing for Nuclear Emergencies: A Brief Look at What's Required. This module would both introduce and summarize the others modules. It would include an overview of the other modules so that someone who only had access to this module would receive a basic orientation to nuclear preparedness and response.
- Civil Defense in the 1980's. The purpose of this module would be to establish the context for civil preparedness. It would include the rationale for civil defense, commonly asked questions and their answers, and a description of FEMA and other agencies involved in civil defense. This module would also feature a discussion of possible scenarios for a nuclear emergency, the rationale for crisis relocation, and the nature and function of the shelter system. The necessity for all elements of society to cooperate in responding to crises would be stressed.
- Nuclear Emergencies and Hazards. This module would provide people with an understanding of the kinds of nuclear emergencies which might occur and the characteristics and hazards involved. It would cover types of emergencies, the nature of nuclear energy and the magnitude of radiation effects, types of effects and associated hazards to human beings, and ways of protecting oneself against radiation effects.
- Preparing to Relocate. The fourth module would address the need for information about the crisis relocation program and how individuals and groups can participate in efforts for community protection. It would define the time periods associated with a crisis, describe warning systems, and instruct people on how to get reliable information about local plans. The module would also discuss how crisis relocation will be directed and controlled, transportation options, and what to take along when relocating. Finally, it would discuss procedures for reception and care, types of shelters, and shelter living.
- Preparing for Survival. This module addresses some of the same issues as the previous one, but on an individual or family, rather than on a community level. It would cover such topics as building and stocking a home shelter, upgrading buildings for fallout protection, hosting evacuees, constructing expedient shelters and ventilation systems, surviving in the wilderness, and protecting farms and livestock.

2. The Media Modules

Research has shown that in a crisis-expectant period people tend to turn to the media for information on the disaster. In any major disaster, the media play a crucial role in warning, informing, and educating the public. It is, therefore, essential to incorporate the media into any public education and training system that is developed.

The model system should include a set of media modules which could be incorporated into newspapers and radio and television schedules in order to reach as wide an audience as possible. Each module would consist of two sections. The first section would discuss the role of the particular medium and its staff in a crisis-expectant situation. The second section of each of these modules would consist of examples of communications appropriate to a medium which could be used either intact, or serve as models for locally developed articles, radio or TV spots, etc. Procedures and guidelines for developing and delivering additional public education messages would also be included. Initial suggestions for the content of the media modules are the following:

- Nuclear Emergency News: Press Kit. In addition to the material on the role of newspapers in disaster education (as indicated above), the Press Kit would include type-set feature articles on topics such as building expedient shelters and hazards of nuclear war (some of which could be adapted from those in the Press Kit of the In Time of Emergency (1966) series.) It would also feature outlines for articles on local civil preparedness activities, such as relocation directions, with guidance on where to locate the missing information.
- Nuclear Emergency News: Radio Resources Kit. The material on the role of radio in a disaster would emphasize its function in the warning system. However, it would also feature a consideration of the educational potential of radio in peacetime and a crisis-expectant period. The kit would also include scripts for spot announcements on such topics as warning signals and relocation routes, directions for covering civil preparedness content in radio interview shows, and other guidance for using radio as a resource in civil preparedness education and training.
- Nuclear Emergency News: Television Kit. The kit for use by local TV stations would be similar to the radio kit in focus and function, but it would include a wider range of options in terms of its use of promotional spots, public service programs introducing local civil preparedness personnel, demonstrating protective actions, etc., and showing films. The kit should include a catalogue of audiovisual resources which might be used.
- Nuclear Emergency Media Kit. This kit could be used by the communications officer in a civil preparedness agency or by a volunteer from the field of advertising, etc., to develop contributions to public education via other media such as billboards and road signs, posters on public busses, in government and commercial buildings, etc., skywriting, handouts provided by local businesses, etc.

3. The Special Purpose Modules

Products in the special purpose group could be limited to the ones listed on the chart or the group could expand to include products tailored specially for any self-defining audience. In practice, it seems feasible to divide this group of modules into two types: adaptations of general information for special audiences; and new products for addressing specific groups and professions.

- Adaptation of Materials for Special Audiences. This group of materials would consist of adaptations of the five core modules, or at least of the first one, Preparing for Nuclear Emergencies, for special audiences defined by language, reading level, or physical handicaps. It would also include a flier version of Preparing for Nuclear Emergencies, and a separate publication of the Crisis Checklist to be included in all of the core modules.
- New Products for Addressing Specific Groups/Professions. The second group of modules would consist of a series of booklets intended to prepare members of various professions or workers in different industries to play an effective role in nuclear emergency preparedness and response. These modules could be applied in both pre-service and in-service training programs for a variety of professions.

The rationale for tailoring such materials to professional groups rests with the wealth of expertise from which these individuals can draw and the importance of their contribution in a disaster situation. It would obviously be more efficient for professionals to build on their previous expertise than have randomly selected volunteers trained in haste for various roles. Furthermore, people who have a job they know how to do are more likely to be able to respond effectively in an emotionally charged situation. In addition, some professions (e.g., architecture and construction) already have an important role in increasing disaster preparedness during peacetime. In most cases, appealing to professional identity and organizational ties may help motivate people to participate in emergency planning.

A number of booklets for special groups such as farmers or builders are already available. Reports on the potential emergency role of doctors,

veterinarians, and dentists exist as well. A model guidebook could be produced to help government agencies and professional organizations develop, in cooperation with FEMA, such modules for their respective constituencies. Industries involved in Organizational Relocation Planning could also develop such materials. In a crisis-expectant period, businesses and industries could contribute to the emergency preparations by printing and distributing such booklets to their employees.

Other already developed booklets that might be useful here include Christiansen's Guidance for Sharing Residential Space During Emergencies (1979); Kearny's booklets on building fallout meters, and ventilation systems (1978, 1972, respectively); and the Radiological Defense Manual (DCPA, 1977b).

4. Support Modules

A fourth category of modules may be identified which would serve to facilitate the use of the other three. These materials would be used by local emergency preparedness personnel, community leaders, and other volunteers, to manage or conduct the education and training of the general public. Examples of such materials include the following:

- Managing Public Education and Training in a Nuclear Emergency. This manual would be intended for use by a local civil preparedness director or someone delegated by him/her to superintend public education activities. It would orient the manager to the content, purpose, and ways of using all of the other materials in the system and offer guidance in implementing and coordinating the local public education and training system.
- Public Education Crisis Assistance Manual for a Nuclear Emergency. This manual would serve to help volunteers identify and educate "hard-to-reach" members of the population such as the elderly or infirm, poor readers, etc. in essential emergency preparedness and response, relocation, etc. It would present ways of adapting and delivering the material in the core modules to these special audiences.
- A Nuclear Emergency Manual for Community Leaders. In a crisis-expectant situation, some concerned community members and groups would probably be interested in classes, workshops, or other group learning experiences. This manual would help group leaders serve as learning coordinators and use the core modules as resources. It would include guidance on planning instruction, selecting and adapting learning materials, and developing appropriate learning experiences.

In summary, it should be understood that the materials described in this section are examples of the way in which the basic model structure of core modules, media modules, special purpose modules, and support modules might be interpreted in the form of specific products. The basic design seems to be the most feasible way of meeting the CEETS requirements; whereas, the design of individual products should be considered as tentative statements to be refined as the cycle of design, development, and evaluation progresses.

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F. Recommendations for Future Development

The CEETS model presented in this report is a model of the instructional components (materials and resources) that seem to be required to provide adult Americans with the knowledge, skills, and attitudes necessary to cope with a nuclear crisis situation (or any emergency situation that requires population relocation). The specifications for these instructional components were derived from whatever research and case study analyses were available and from an analysis of factors that were presumed to dictate requirements for the instructional components: audience factors, possible training settings, behavioral and informational demands associated with nuclear emergencies, and instructional presentation considerations.

Although the resultant model describes systems components that appear to have some relevance for a variety of settings and needs, the model in its present state of development is incomplete and untested. It is incomplete in the sense that it does not include a specification of the procedures and arrangements necessary to implement the instructional components in various crisis situations and settings; and it is untested in the sense that the instructional components, the procedures and arrangements for the delivery of educational and training, and finally, the total system, has not been tried out in naturalistic settings. The following represent a minimal set of activities that must be carried out before the CEETS system can be considered to be complete and institutionalized. These activities are arranged as a sequence of potential research and development projects.

- The development and pilot testing of the core modules. (These modules are being developed in prototype form as part of the present project.)
- The development and testing of selected, high-priority, special purpose modules.
- The development and pilot testing of the media modules.

- The design of a crisis-expectant education and delivery system to include a specification of procedures for expansion, responsibilities for dissemination, monitoring, and evaluation, arrangements and responsibilities for providing training and training facilities, and procedures for updating information and providing training and education tailored to local policies and plans.
- The field testing of the instructional components along with the support modules in selected delivery configurations.

The result of completing these design, development and evaluation activities would be the capability to deliver and maintain education and training in a comprehensive and flexible manner in a variety of situations and time periods.

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Far West Laboratory for Educational Research and Development
October 31, 1980, 100 pages, ERM-C-0017, Work Unit 4422D

A model of an education and training system is presented. The system is designed to provide all necessary instruction and instructional support services for informing and guiding the behavior of the adult U.S. population during an emerging nuclear crisis.

The model was developed in order to describe and organize the various environmental constraints, instructional needs, and system requirements that must be accommodated in a "crisis-expectant" education and training system. These latter system requirements include adaptability to various audiences, expandability during a crisis, and utility for peacetime disasters. These and other requirements for the model are presented in Chapter One of the report.

Chapter Two provides literature analyses for the four principal factors governing the design of the instructional materials: the audience, the context for system deployment, behaviors required in a crisis, and instructional format options. Chapter Three synthesizes input information into sets of requirements, displays instructional options, describes alternative deployment scenarios, and presents an evaluation of extant instructional programs. A composite model of an education and training system is then presented along with system variations appropriate for the three training scenarios. Suggestions for the implementation and delivery of the system are also included in this chapter.

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The model was developed in order to describe and organize the various environmental constraints, instructional needs, and system requirements that must be accommodated in a "crisis-expectant" education and training system. These latter system requirements include adaptability to various audiences, expandability during a crisis, and utility for peacetime disasters. These and other requirements for the model are presented in Chapter One of the report.

Chapter Two provides literature analyses for the four principal factors governing the design of the instructional materials: the audience, the context for system deployment, behaviors required in a crisis, and instructional format options. Chapter Three synthesizes input information into sets of requirements, displays instructional options, describes alternative deployment scenarios, and presents an evaluation of extant instructional programs. A composite model of an education and training system is then presented along with system variations appropriate for the three training scenarios. Suggestions for the implementation and delivery of the system are also included in this chapter.

A MODEL FOR EDUCATION AND TRAINING FOR A CRISIS-EXPECTANT PERIOD

Unclassified

Far West Laboratory for Educational Research and Development
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